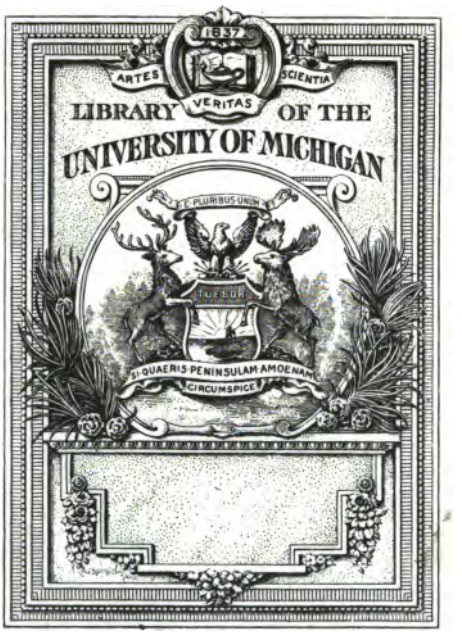
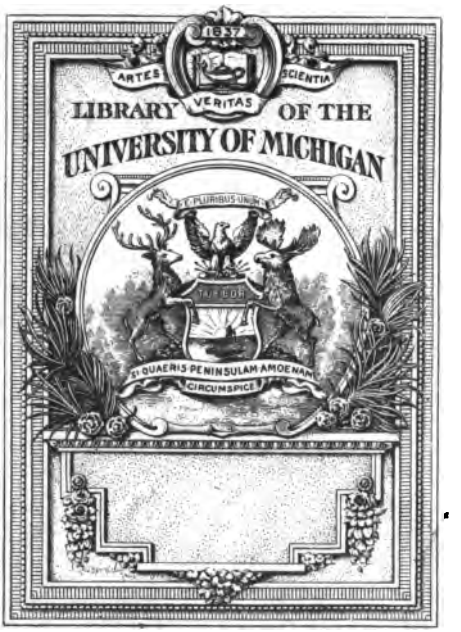
# TARR & McMURRY'S GEOGRAPHIES

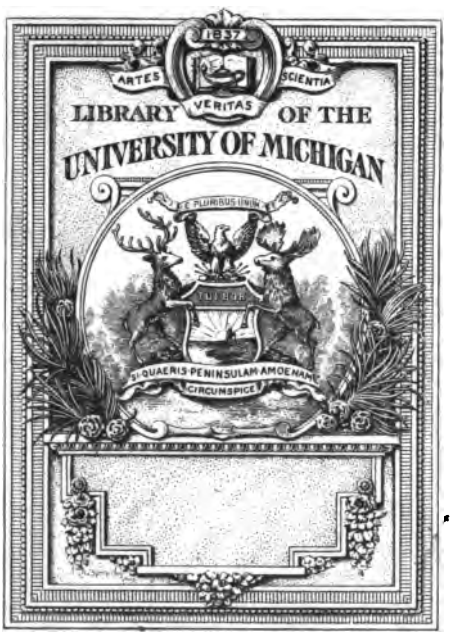
SUPPLEMENTARY VOLUME

NEW YORK


1837
ARTES
VERITAS
SCIENTIA
LIBRARY OF THE
UNIVERSITY OF MICHIGAN
E PLURIBUS UNUM
TUEBOR
SI QUAERIS PENINSULAM AMOENAM
CIRCUMSPICE


1837
ARTES
VERITAS
SCIENTIA
LIBRARY OF THE
UNIVERSITY OF MICHIGAN
E PLURIBUS UNUM
TUEBOR
SI QUAERIS PENINSULAM AMOENAM
CIRCUMSPICE

NEW YORK


1837
ARTES
VERITAS
SCIENTIA
LIBRARY OF THE
UNIVERSITY OF MICHIGAN
E PLURIBUS UNUM
TUEBOR
SI QUAERIS PENINSULAM AMOENAM
CIRCUMSPICE

NEW YORK

The Co.

TARR AND McMURRY GEOGRAPHIES

*SUPPLEMENTARY VOLUME*

# NEW YORK



BY

R. H. WHITBECK, A.B. (CORNELL)
ASSISTANT IN PHYSICAL GEOGRAPHY IN
CORNELL UNIVERSITY

New York
THE MACMILLAN COMPANY
LONDON: MACMILLAN & CO., LTD.
1901

Norwood Press
J. S. Cushing & Co. — Berwick & Smith
Norwood Mass. U.S.A.

# PREFACE

In writing this Supplement the underlying principle has been to apply to the state treatment the principles which have guided in the preparation of the Series; namely, a causal treatment based upon physiography. For example, instead of merely stating that there is a fall at Niagara, it has been shown why there is a fall at that place and how it has influenced the development of the region; and instead of stating the mere fact that the Erie Canal extends down the Mohawk valley, it has been shown on the one hand why this was possible, and, on the other hand, how wonderfully the history and industrial development of the state have depended upon the physiographic conditions which rendered the Erie Canal possible. A further guiding principle has been an endeavor to leave a series of strong and lasting impressions rather than a still greater number of disconnected facts. With this idea in mind mere lists of places and industries have been replaced by connected statements in which the location and industries of places naturally receive mention. The effort has been to provide a Geography of New York which shall have a value of its own, and not merely for the purpose of meeting a demand of committees to aid in the sale of the Series.

Both authors of the Series have carefully examined and criticised the Supplement, and especial acknowledgment

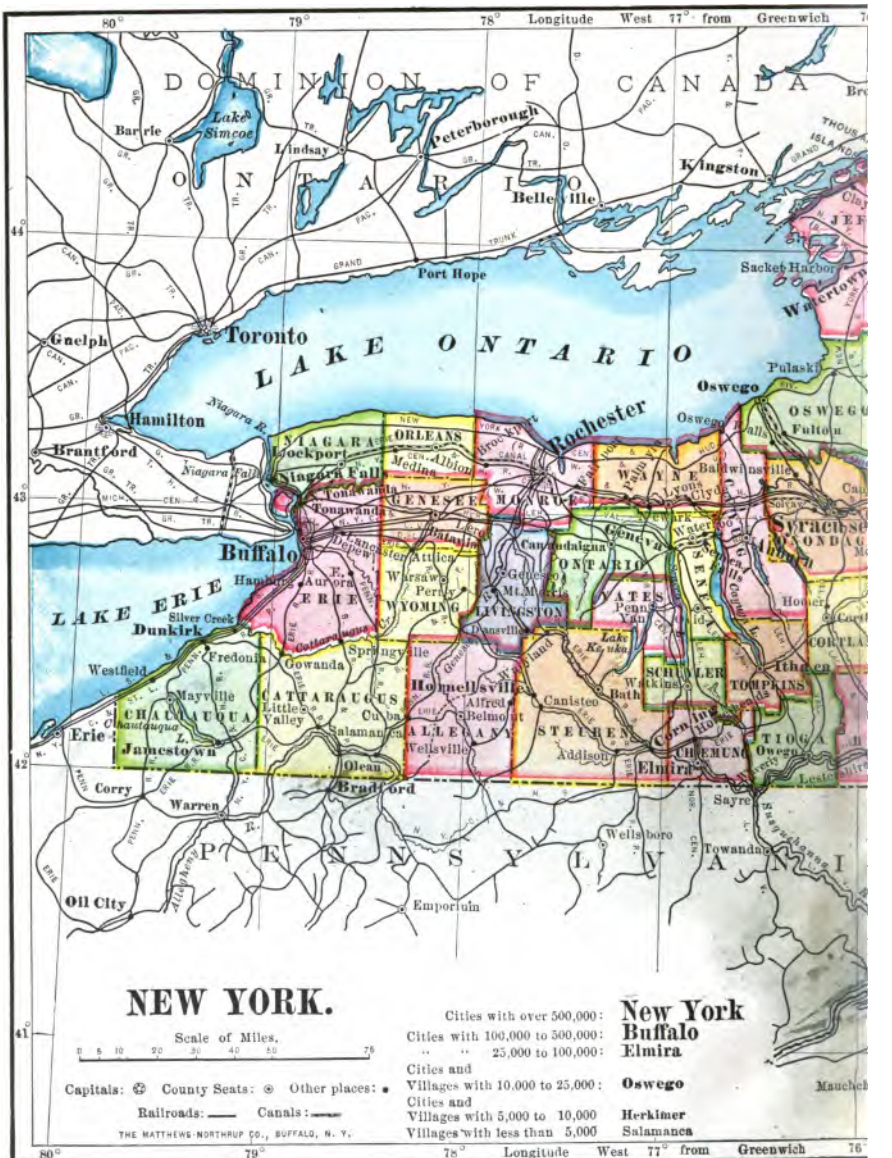
is due to Professor Tarr for his aid in the preparation of the physiographic introduction. Hearty acknowledgment is also due Professor C. N. Millard, Supervisor of Grammar Grades of Buffalo, Principal G. H. Walden of Grammar School No. 10, Rochester, and Professor C. Stuart Gager, New York State Normal College at Albany, for valuable criticism and suggestion.

Acknowledgment is also due for the following photographs: Figs. 14, 45, 46, 59, 60, and 62, presented by the Fort Stanwix Canning Company, Rome; Fig. 26, presented by President Low of Columbia University; Fig. 56, presented by J. M. Duncan of Silver Springs; Fig. 17, presented by Mr. Daniels of the New York Central R.R.; Fig. 50, presented by the Mt. Hope Nurseries, Rochester.

R. H. W.

# CONTENTS

NEW YORK


Longitude West 77° from Greenwich
DOMINION OF CANADA
ONTARIO
LAKE ONTARIO
LAKE ERIE
PENNSYLVANIA
Lake Simcoe
Barrie
Lindsay
Peterborough
Kingston
Belleville
Port Hope
Sacket Harbor
Toronto
Guelph
Hamilton
Brantford
Niagara R.
Niagara Falls
Lockport
Niagara Falls
Tonawanda
Buffalo
Hamburg
Silver Creek
Dunkirk
Westfield
Fredonia
Erie
Corry
Warren
Oil City
Jamestown
Mayville
Chautauqua
Olean
Bradford
Emporium
Rochester
Oswego
Pulaski
Fulton
Syracuse
Auburn
Ithaca
Elmira
Corning
Owego
Sayre
Towanda
Wellsboro
Canandaigua
Geneva
Penn Yan
Hornellsville
Alfred
Belmont
Wellsville
Canisteo
Addison
Bath
Watkins
Homer
Cortland
Lake Keuka
Lake Ontario
Scale of Miles.
0 5 10 20 30 40 50 75
Capitals: County Seats: Other places:
Railroads: Canals:
THE MATTHEWS-NORTHRUP CO., BUFFALO, N. Y.
Cities with over 500,000: New York
Cities with 100,000 to 500,000: Buffalo
" " 25,000 to 100,000: Elmira
Cities and Villages with 10,000 to 25,000: Oswego
Cities and Villages with 5,000 to 10,000 Herkimer
Villages with less than 5,000 Salamanca

# NEW YORK.

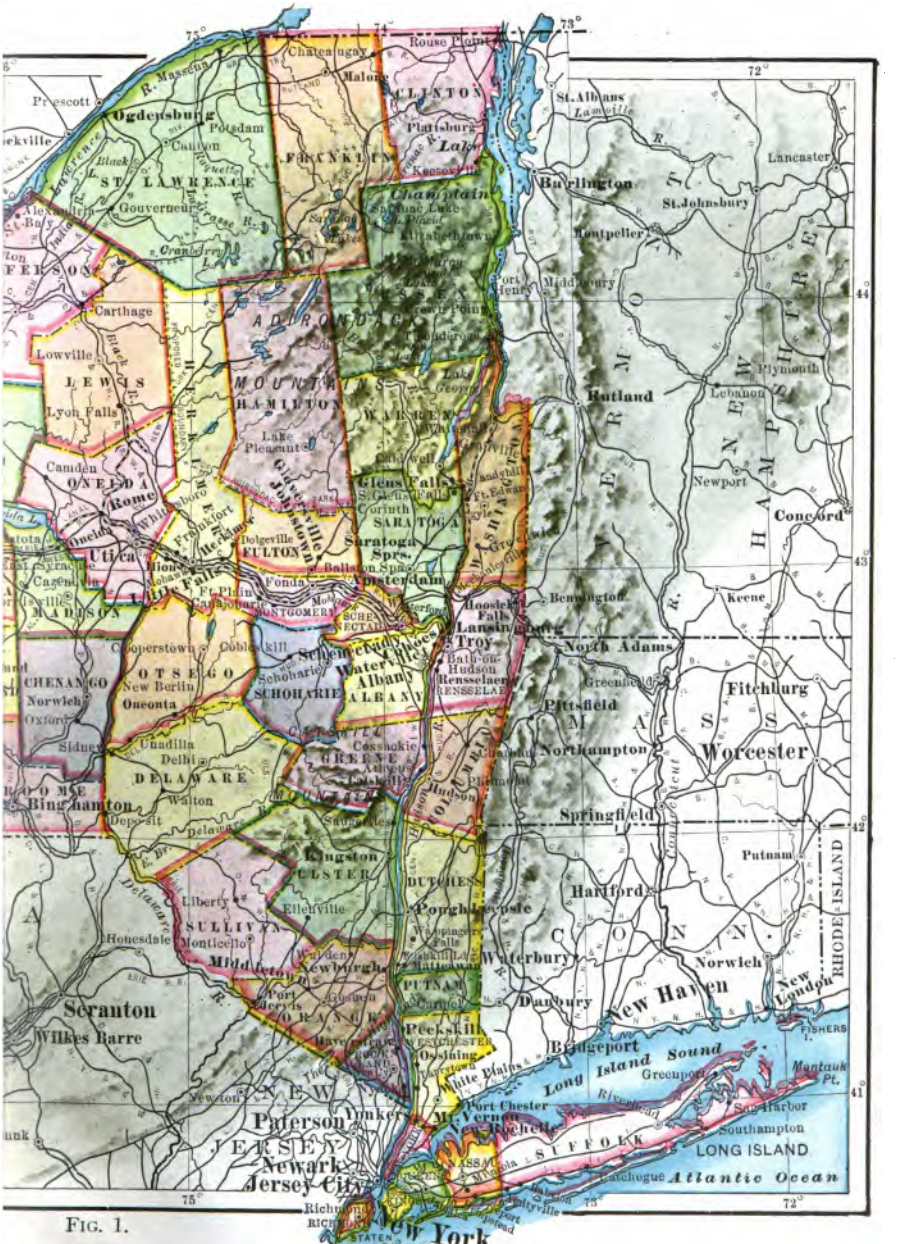

75°
74°
73°
72°
44°
43°
42°
41°
Rouse Point
Chateaugay
Malone
Prescott
Ogdensburg
Potsdam
Canton
R. Massena
CLINTON
Plattsburg
Lake
FRANKLIN
Keeseville
ST. LAWRENCE
Gouverneur
Alexandria
Cranberry L.
Champlain
Saranac Lake
L. Placid
Elizabethtown
St. Albans
Lamoille
Burlington
Montpelier
St. Johnsbury
Lancaster
Carthage
ESSEX
Port Henry
Middlebury
Crown Point
Ticonderoga
ADIRONDACK MOUNTAINS
Lowville
LEWIS
Lyon Falls
HERKIMER
HAMILTON
Lake George
WARREN
Lake Pleasant
Rutland
VERMONT
Lebanon
Plymouth
NEW HAMPSHIRE
Camden
ONEIDA
Rome
Whitesboro
Oneida
Utica
Frankfort
Herkimer
Ilion
Little Falls
Gloversville
Johnstown
Glens Falls
S. Glens Falls
Corinth
SARATOGA
Saratoga Sprs.
Ballston Spa
Dolgeville
FULTON
WASHINGTON
Ft. Edward
Sandyhill
Greenwich
Newport
Concord
Amsterdam
Fonda
Ft. Plain
Canajoharie
MONTGOMERY
Syracuse
Cazenovia
MADISON
Hoosick Falls
Lansingburg
Troy
Cohoes
Watervliet
Schenectady
Albany
ALBANY
Bennington
Keene
North Adams
Cooperstown
Cobleskill
OTSEGO
New Berlin
Oneonta
CHENANGO
Norwich
Oxford
Sidney
Schoharie
SCHOHARIE
Bath-on-Hudson
Rensselaer
RENSSELAER
Greenfield
Fitchburg
Pittsfield
MASS.
Northampton
Worcester
Unadilla
Delhi
DELAWARE
Walton
Deposit
BROOME
Binghamton
Coxsackie
GREENE
Athens
Catskill
COLUMBIA
Hudson
Chatham
Saugerties
Springfield
Putnam
RHODE ISLAND
Kingston
ULSTER
DUTCHESS
Poughkeepsie
Hartford
CONN.
Ellenville
Liberty
SULLIVAN
Monticello
Honesdale
Delaware R.
Wappingers Falls
Fishkill Ldg.
Matteawan
Waterbury
Newburgh
Middletown
Port Jervis
Goshen
ORANGE
PUTNAM
Carmel
Danbury
New Haven
Norwich
New London
Scranton
Wilkes Barre
Peekskill
WESTCHESTER
Ossining
Haverstraw
ROCKLAND
Tarrytown
White Plains
Bridgeport
Long Island Sound
Greenport
Fishers I.
Montauk Pt.
Newton
NEW JERSEY
Paterson
Yonkers
Port Chester
Mt. Vernon
New Rochelle
Riverhead
Sag Harbor
Southampton
SUFFOLK
LONG ISLAND
Newark
Jersey City
NASSAU
Mineola
Patchogue
Atlantic Ocean
Richmond
RICHMOND
STATEN ISLAND
New York

FIG. 1.

# NEW YORK STATE SUPPLEMENT

## Physiography and Natural Resources

Introductory Questions. On a map of the United States locate New York State exactly. What states border New York? What waters? Be prepared to draw from memory an outline map of the state, with names of states, rivers, etc., on the border. Make a dot to indicate the position of each of the five largest cities. Suggest reasons for the position of each of these cities. What advantage do you see in the location of New York State as compared with other Atlantic states? It is called the "Empire State." Why? Suggest reasons why New York deserves this distinction? How does it compare in population with other states? How does it compare in area and population with all of New England? (For these facts see tables in the Appendix at the close of either the First, Second, or Third book of Geography.)

What is the latitude of northern New York? Of southern New York? Between what meridians of longitude does the state lie? Examine the relief map (Fig. 2) to find facts about the relief. Describe the relief of the state. Tell about the climate from your own experience. What parts of the world that you have studied have climate, relief, and crops similar to those of New York? Name some parts that are altogether different in these respects.

By far the greater part of New York is a region of low plateaus and rolling plains; but the northern and eastern parts include mountainous sections. To understand the industrial development of the state we must know something of its physiography; and to gain this knowledge we shall study the state by sections, based upon physiographic differences.

**The Adirondack Province** (Fig. 5). — Northeastern New York, north of the Mohawk River, is a region of hard and very ancient rocks, in fact, one of the oldest portions of

FIG. 2.

**Relief map of New York. Point to the two highland areas. Describe the drainage. Point out a natural lowland route from the sea to Lake Ontario.**

North America. Because of the hardness of the rock these mountains have so resisted the weather that they stand well above the surrounding country. Mt. Marcy, the highest mountain peak in New York, has an elevation of 5344 feet,

The mountain slopes are so steep and the valleys so strewn with boulders that there is little opportunity for farming. Therefore vast tracts in the Adirondacks remain to this day a forest wilderness (Fig. 3). As a source of lumber this forest is of great value, and there is a belt of towns and cities completely surrounding the Adirondacks in which the principal industries depend upon the products of these woods. The logs and lumber are brought out in some places by sled, in others by rail, but principally by the river floods. Since the mountains form a central divide from which streams flow north, east, south, and west, the logs may be sent in all these directions by water. Many of the streams also furnish power for manufacturing.

FIG. 3.

The forest covered slopes of the Adirondacks (copyrighted by S. R. Stoddard).

The streams receive much water from the heavy snows of the mountains; and the many lakes serve as great storage reservoirs from which the water is delivered to the streams even in times of drought. The lakes are also important in other ways, as, for example, in attracting tourists by their beauty, and in the opportunity which they give for boating and fishing. There are hundreds of lakes among the Adirondacks, and from some of the mountains one can count forty or

fifty in plain view. Some of the most beautiful of these lakes are the Ausable Lakes, Lake Placid, Schroon Lake, and the Saranac Lakes.

The forests as well as the lakes are important in regulating the flow of the streams. In the shade of the woods snow is protected from melting, and the water is checked from running rapidly away by the tangle of roots, the moss and leaves. When the forest is cut away, however, the rain waters and the waters of the melting snow run quickly off, then the streams are flooded at one time and nearly or quite dry at another. Partly for this reason, partly because of the beauty and attractiveness of the forest, and partly because the removal of the timber has been so rapid that its total destruction has been threatened, the state has set aside large tracts, forming the Adirondack Forest Reserve, held and protected from destruction for the benefit of the people.

In addition, the state has set aside one portion of the Adirondacks as a kind of forest farm, and in connection with it has established a School of Forestry at Cornell University. Under the direction of this school an attempt is being made to carry on lumbering by better methods.

FIG. 4.
Upper Ausable Lake, near Mt. Marcy, Adirondacks.

By former methods everything was cut away and much was wasted; but by the new method only those trees that are best or most needed are removed, and when one is cut down another is put in its place.

The beautiful scenery, the invigorating air, and the fishing and hunting attract tourists in great numbers; and to accommodate them there are many hotels among the mountains. But in winter the Adirondacks are wrapped in

snow and almost deserted excepting by lumbermen. There is, however, one class of people who go to the mountains in winter, namely, those who are suffering from lung trouble. Of these many go to Saranac village, where the climate is especially favorable; and near by is the site of the New York State Sanitarium for incipient consumptives.


FIG. 5.

In the lowland which surrounds the Adirondacks there is some mineral wealth. Numerous veins of iron have been found in the rock; but the distance from coal has been a serious disadvantage and therefore there are not many mines. The most extensive and best-known iron deposits are near PORT HENRY and CROWN POINT, whose location on the shores of Lake Champlain is especially

favorable for iron-smelting and the shipment of iron ore. Why? Graphite and talc are found in this section (Fig. 9), also many building stones, including granite and sandstone. Limestone for use in iron smelting is also quarried.

*Thus we see that while the Adirondack region is not as a whole adapted to agriculture, it supplies some valuable minerals, much lumber, and other forest products, as, for example, wood for the manufacture of paper. It is, moreover, a great park to which thousands of people resort in search of health, rest, and recreation.*

**Mountain Region of Eastern New York** (Fig. 5). — Extending into New York from New Jersey is a low, hilly region, really a very much worn mountain range. These low mountains, increasing in elevation toward the north, extend northeastward across the Hudson, and thence into Massachusetts and Vermont. In the latter state they are known as the Green Mountains.

FIG. 6.

The Palisades of the Hudson.

Many ages ago this region, from the New Jersey boundary to Vermont and eastward far into New England, was so disturbed by mountain folding that many lofty ranges were produced. Through the ages these have gradually crumbled away, especially where the rocks were softest. Now, although their site

is for the most part a series of low hills, their general history is told by the fact that the rock layers are greatly bent and folded. The steep bank of the Hudson at the Highlands clearly reveals this folding.

The very interesting *Palisades*, however, were not formed in this way; they are old lava beds that were once melted rock. This lava sheet is crossed by many cracks and joints, so that, as it breaks away, columns are left standing, giving rise to the name Palisades, from the resemblance to rows of stakes (Fig. 6).

Being so low, these ancient mountains have few slopes which are too steep or rocky for farming, and therefore the forest has been extensively cleared away for farms and pastures. How does this contrast with the Adirondacks? The mineral products include iron ore, building stone, flagstone, and clays (Fig. 9). The clays, which are of great value in the manufacture of bricks and tiles, were deposited in the waters which flooded the Hudson valley while the glacier was melting from the country.

*This region of worn down mountains is adapted to farming and grazing, and the large cities in its vicinity furnish a market and thus add to its value for this purpose. Among the mineral products are iron ore, building stone, flagstone, and clays.*

**Long Island.**— This island, by far the largest along the eastern coast of the United States, differs very decidedly from the neighboring land. It is low, with numerous small hills, and is made of soft, loose sands and clays. In most of its features Long Island resembles the low plains of eastern New Jersey. In fact, it is apparently a continuation of those plains, having been cut off from them by a sinking of the land.

The great glacier which covered northeastern North America reached down as far as Long Island, where its front remained for a long time. As it advanced it brought clay, sand, and stones frozen in its bottom layers; and, as the ice melted, these dropped from it and accumulated along its margin. In the course of time great quantities of rock fragments were thus dragged to the ice front and there deposited, forming ridges of irregular hills with many kettle-shaped depressions between. This series of elevations, known as a *terminal moraine*, extends from eastern Long Island to Brooklyn, thence to Staten Island and the mainland of New Jersey. Extensive plains of gravel and sand along its margin were built on the southern side of this moraine by streams from the melting glacier.

The soil of Long Island is so sandy that large areas are unfitted for agriculture, and are therefore overgrown with scrub-oak and pine. Here, as in the Adirondacks, deer are still found in a wild state, carefully protected by state laws. Where the soil is less sandy there is careful cultivation, for the nearness to New York makes truck-farming very profitable. The island is also a popular summer resort. Why might that be expected?

*This island of clay and sand, cut off from the mainland by the sinking of the land, is so sandy in places that it is barren; but nearness to the New York market makes gardening profitable wherever the soil permits. Its climate and scenery attract large numbers of summer visitors.*

**The Catskills** (Fig. 5). — The Catskills, second only to the Adirondacks in elevation, differ from them very decidedly. The rocks are not folded, as in true mountains, but are made of almost horizontal beds of hard sandstone. Since the sandstone is harder than the rocks round about, it has resisted the weather. Therefore the Catskill plateau

stands above the surrounding country and is commonly called the Catskill Mountains.

Unlike the Adirondacks these highlands supply no mineral products of importance excepting building stone. Agriculture is possible in the valleys and in the lower country which skirts the more elevated portion. The

FIG. 7.
Lake Mohonk, in Ulster County.

broad expanse of wooded hills furnishes some lumber, and the many picturesque lakes and slopes attract large numbers of tourists.

*Like the Adirondacks the scenery and mountain air of the Catskills attract summer visitors. There is some lumbering, and some farming in the valleys and on the lower slopes.*

**Plains and Plateaus of Central and Western New York** (Figs. 5 and 8). — Although formed at the same time as the Catskills, and raised above the sea in the same man-

ner, this region is not nearly so mountainous as the Catskills, because the shales, limestones, and sandy layers of which it is composed are not so hard. Nevertheless, near the Pennsylvania line, where the rocks are sandy, some of the hilltops reach from fifteen hundred to two thousand feet above sea level; and the stream valleys which deeply cut the plateau make it a very hilly region

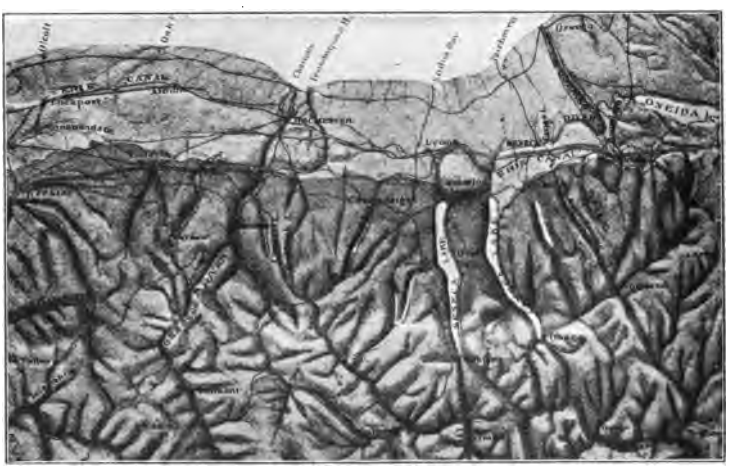


FIG. 8.

The plateau and plains of Central New York.

(Fig. 8). In southwestern New York, in Steuben, Allegany, and Cattaraugus counties, the hilly plateau almost rivals the Catskills in ruggedness and elevation.

Toward the north the hills become lower and descend into a very level plain which reaches to the shores of Lakes Erie and Ontario (Fig. 8). Throughout most of its extent this lake plain is bounded on its southern side by a steeply rising slope or *escarpment*. This escarpment is

especially well seen in the west, in Chautauqua County, and in the east where the plain merges into the Mohawk valley lowland. The lake plain west of Rochester is divided into two plains at different levels, the lower called the Ontario plain, the upper, the Erie plain (Fig. 5). The steep slope or escarpment between these two plains extends from near Rochester westward far into Canada. It is caused by the hard layer of limestone over which the Niagara cataract tumbles. Buffalo is on the upper or Erie plain, while Lockport is at the point where the Erie canal descends to the base of the escarpment. Near the lakes these plains are the seats of important fruit-raising industries.

Because of the fertile soil, the favorable climate, and the moderately regular surface, together with the excellent market in the cities, agriculture is so well developed that the greater part of these plains and plateaus is cleared of forest and used for farming and pasturage. This is the great agricultural section of the state and one of the best in the country. Nevertheless, here and there are patches of rocky soil unsuited to farming, and hence still forest-covered. This is especially true in the higher parts of the plateau near the Pennsylvania boundary, where some lumbering is still carried on.

Among the valuable mineral products (Fig. 9) are limestone and sandstone for building, and bluestone of value as flagstones for sidewalks. Oil and gas were long ago discovered in southwestern New York. Another mineral deposit of great importance in this section is salt.

At one time, while the sea covered this part of the state, the climate was so dry that the salt water evaporated and beds of salt were left. These were later covered by limestone and shale and thus preserved in the earth. This layer of

salt reaches the surface along a line extending westward from near Syracuse; and since the salt bed dips into the earth toward the south, it may be reached by borings over a large area of country south of the latitude of Syracuse (Fig. 9).

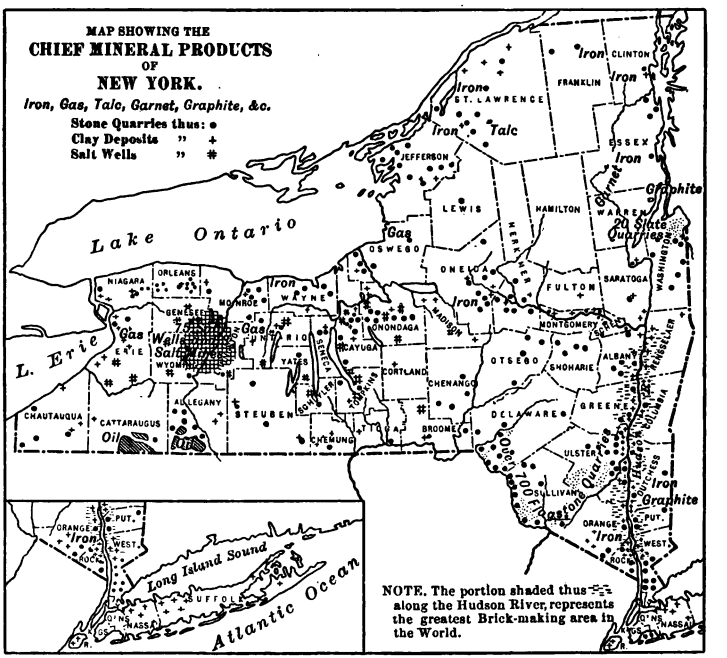



FIG. 9.

QUESTIONS. — Where is the most important salt region? In what other counties are salt wells located? Where are the oil fields? Where is gas found? iron? graphite? talc? garnet? Where are the most valuable clay deposits? What is said about the clay area in the note on the map? Where are flagstones chiefly quarried? slate? Why are more quarries opened in southeastern New York than in northern New York? What mineral deposits are found on Long Island?

*This plateau, while hilly in the south, becomes lower and more regular toward the north, where it merges into a low plain. There are hilly tracts unsuited to farming, and in the southwest there is still some lumbering; but most of this region is excellent farm land, especially the lake shore plains and the Mohawk valley. It is therefore mainly an agricultural section; but valuable mineral deposits, including oil, gas, salt, building stones, and clays, are found.*

**Drainage of the State.** — The river systems of New York are interesting in many ways. Owing to the effects

FIG. 10.
A view among the Thousand Islands.

of the glacier (p. 17), many of them have been caused to tumble in picturesque rapids and falls; others have their courses interrupted by lakes. The region of most abundant lakes is the Adirondacks. Name some of the larger lakes among these mountains (Fig. 1). Make a drawing to show the location and form of the two large lakes which lie at the eastern base of the Adirondacks. Into what river do they empty? Another region of abundant lakes is in southeastern New York; but here all the lakes are small (Fig. 7). Make a drawing to show the location, shape,

and names of the Finger Lakes of central New York. Locate Chautauqua Lake. Make a drawing of Lakes Erie and Ontario. Notice especially the irregular eastern end of Ontario where the lake waters enter the St. Lawrence between the picturesque Thousand Islands (Fig. 10).

The waters that fall upon the surface of New York find their way to the sea through many different streams. In the east there are two great central divides from which the water flows in various directions. From one of these, in the Adirondacks, much of the drainage finds its way into the St. Lawrence, though a part enters the sea through the Hudson. From the other, that of the Catskills, some also enters the Hudson and some the Delaware. Farther west the Susquehanna and St. Lawrence receive most of the water, though in the extreme west the large Allegheny receives water which finally enters the Gulf of Mexico through the Mississippi River.

Make a drainage map of New York to show the larger lakes and the main tributaries of the five great river systems which receive water from New York (St. Lawrence, Hudson, Delaware, Susquehanna, and Allegheny). Which drains the greatest territory? Which drains the least? Which system has the most lakes? What is the name of the largest tributary to the Hudson? Name the four largest tributaries to the St. Lawrence system in New York.

**Sinking of the Land.** — One of the most important physiographic facts connected with New York is that it once stood higher than now. When the land sank the sea was admitted into the valley of the Hudson, which was thereby changed from a small stream, doubtless shallow and with rapid current, to a deep estuary into which ships

could enter. Therefore the Hudson is not a true river, but an ancient river valley into which the tide rises as far as Troy. The harbor thus formed at the lower end (Fig. 19) of the partly drowned Hudson has various branches at the places where the sea has entered small tributaries of the Hudson. The hills between these drowned valleys now form islands, such as Manhattan and Staten Islands (Fig. 18).

This excellent harbor is a natural site for a large city. It is freely open to the ocean, yet protected from winds and waves, and also connected by water with the interior of the state. Moreover, the sinking of the land separated Long Island from the mainland, thus opening water communication in the protected Sound with the seacoast cities of southern New England. Being a natural gateway, and the most favorably situated port on the continent, New York has naturally become the greatest city in the New World.

*By the sinking of the land the excellent harbor of New York has been formed and water communication has been opened both with the interior and with the coast of southern New England, thus making the natural site for a great city.*

**Effect of the Glacier.** — The great ice-sheet, which advanced from Labrador, invaded New York and covered the entire state with the exception of a small portion in the southwest. It overtopped the loftiest mountains and transformed the country to a vast plateau of ice. Stripping off the soil, the glacier carried the rock fragments forward, and as these were dragged up to the edge of the ice, where it was melting, they were dropped along the margin, forming the terminal moraine which is so well

developed on Long Island (p. 7), at Jamestown, and elsewhere.

In time the climate changed and the ice slowly melted back. Every now and then the melting was checked for a while and moraines were built along the ice front. Such moraines are found in many parts of the state. They consist of a series of low gravel or clay hills, perhaps twenty-five or possibly even a hundred feet high, confusedly thrown together and with many depressions, called *kettles*, between.

FIG. 11.

**The northern ends of two drumlins near the New York Central Railway, north of Auburn.**

As the glacier melted away the rock fragments that were frozen in the glacier, or were being dragged along beneath it, were scattered over the surface between these moraines. This glacial deposit, called *boulder clay*, or *till*, forms the soil of most of New York State. In places, especially on the hilltops and hill slopes, it is very thin; but in the valleys it is sometimes one or two hundred feet deep. Usually this glacial soil is a thin sheet covering the rock; but sometimes its form is peculiar. For instance: in the region between Syracuse and Rochester a wide area is ridged up into oval hills, known as *drumlins* (Fig. 11).

One may often find scratches on the rocks, and on the pebbles in the till, which were made as the ice ground the stones together or dragged them over the bed rock. The scratches on the bed rock point toward the north, whence the ice came. Further proof of this source of the ice is found in the foreign pebbles which the till contains. These include granite, gneisses, and other rocks which were brought by the glacier from ledges in Canada. The farmers of central New York call them "hard heads," because they are so much harder than the bed rock of the region.

While the ice was melting, vast quantities of water were supplied, far more than the streams now carry. These floods washed away much of the clay and left beds of sand and gravel, especially in the valleys. Some of these sand and gravel beds were built into broad plains, others into ridges or hummocks. As a result of the action of ice and water there are often different kinds of soil in a small area, even on a single farm. That explains why one part of a farm may be far more productive than another part, as is sometimes the case.

In many cases the valleys that existed before the glacial period were so filled with drift by the glacier that the streams were turned aside and forced to cut new valleys. In making these new valleys the streams have often reached the rock and cut gorges in it, through which the water cascades (Figs. 12 and 53), leaping from ledge to ledge in its rapid descent. These rapids and falls now furnish valuable water power, and therefore the glacier may be held responsible for causing the power which has been of so much value to manufacturing industries in New York.

Of these waterfalls the greatest is Niagara. Before the glacial period there were valleys in this region; but the ice so filled them with drift that when the glacier melted away many of the streams found no old valley to occupy. This was

true of Niagara River, which, as the ice melted away, flowed out of Lake Erie at Buffalo over the surface of the plain, and thence northward to the edge of the escarpment of Niagara limestone (p. 11) at Lewiston. It fell over this escarpment to the base, and then continued to Lake Ontario across the surface of the lower Lake Ontario plain.

FIG. 12.

A view in Watkins Glen, where a stream, turned from its old valley by glacial deposits, is now cutting a gorge through which it hurries in a succession of rapids and falls.

Thus the first Niagara was seven miles north of the present cataract. But the powerful action of the water has been slowly cutting the rock away, and the fall has, year by year, receded until it has reached its present position. The cataract is still working upstream at the rate of four or five feet a year. It remains a cataract because of the hard surface layer of Niagara limestone; and it moves upstream only as fast as the swirl of waters at the foot

of the falls can remove the shales from beneath the limestone and thus, by undermining it, cause it to fall in large blocks. Every year such blocks of limestone fall from the edge of the cataract.

The glacial drift has also, in many cases, formed dams across the valleys and thus held the water back. With scarcely an exception the lakes of New York have been

FIG. 13

The great cataract of Niagara, where the immense volume of water tumbles over the Niagara limestone to course along through the gorge which it has cut as the work of thousands of years. See also Fig. 33.

caused by the glacier in one way or another. Before the glacial period there were few, if any, lakes in the state: not even Ontario and Erie.

This effect of the ice has been of importance in many ways. The lakes store water for use in factories; they modify the climate; and they offer attractive sites for summer homes. But, above all, many of the lakes are navigable; and their abundance and wide distribution make New York the most favored state in the Union with respect to navigable inland waters.

There is another very important effect of the glacier. Before the ice came there was no Mohawk River; but,

instead, there were two streams rising near Little Falls, one, the shorter, flowing eastward into the Hudson, the other flowing westward to the Ontario valley. The ice dragged much drift into this valley, thus levelling the surface considerably. Then as the glacier gradually melted back, it disappeared from the Mohawk earlier than from the St. Lawrence valley. The ice, therefore, formed a dam in the St. Lawrence valley so that the water of the Great Lakes could not flow to the sea that way. The lake water was thus forced to rise to the next lowest outlet, that of the Mohawk, and consequently for a while the waters of the Great Lakes drained into the Mohawk. The beaches formed when Lake Ontario rose to this level may still be clearly traced through Syracuse, Rochester, and Lewiston.

When finally the ice left the St. Lawrence valley, and the lake waters fell to the level of the outflow at the Thousand Islands, the valley that once extended westward from Little Falls was so filled with clay and gravel deposits that the land no longer sloped westward. Therefore the Mohawk now rises near Rome, far to the west of the old divide at Little Falls.

Very early it became evident to certain far-sighted New York people, particularly Governor Dewitt Clinton, that nature had given to New York State a great opportunity. There was the navigable Hudson with its splendid harbor on the sea; there were many navigable lakes; and from Lake Erie westward there was an almost uninterrupted waterway to the southern end of Lake Michigan and the western end of Lake Superior. Between Lakes Erie and Ontario there was the impassable Niagara cataract; but from Buffalo to the mouth of the Mohawk there was a

country so level, with a soil so deep, that a canal could easily be built to connect the Hudson and the Great Lakes. If the Niagara River had been navigable, would the large lake city probably have grown at Buffalo or at Oswego?

FIG. 14.

A view on the Erie Canal in the Mohawk Valley.

Nature seems to have made this a great highway; and all that man was called upon to do was to construct a canal system to connect the navigable waters. This being done, the trade of the West naturally came to New York, and the two greatest cities of the state, Buffalo and New York, have grown up at the two ends of this waterway, while the water route between the two cities is the site of a chain of busy cities and villages (Fig. 1). Branch canals were dug to the other lakes, Ontario, Champlain, Cayuga, and Seneca, and also along the Genesee River.

*The great glacier stripped off the original soil and left in its place a soil of variable quality, rocky in places, clayey here, and sandy or gravelly there. This soil, or drift, was deposited so irregularly that streams were often turned aside, forming gorges and waterfalls, even Niagara itself. The water power thus caused is of immense value to the state. The glacier also caused*

*the many lakes, including Ontario and Erie, thereby opening up a vast area to inland navigation. Further than that, it so levelled the Mohawk valley that the Erie Canal could be easily and cheaply built. This has gone far to give New York State and its largest cities their present importance.*

**Climate.** — SUGGESTIONS FOR REVIEW OF CLIMATE. — Name four conditions which modify the climate of places. What is the latitude of northern New York? From what you have already learned about the state, where would you expect to find influence of altitude? What parts of the state are most influenced by the neighborhood of water? Recall what you have already learned about prevailing westerlies and cyclonic storms. Make observations of the weather to understand the influence of westerlies and cyclonic storms on the climate of your home. Study weather maps in this connection.

Since New York lies in the belt of prevailing westerlies, the average winds are from the west. This is especially true in the winter when the land is cold and the air flows out toward the sea. Being in this wind belt, the state is crossed by the cyclonic storms which develop in the westerlies; and this gives rise to variable weather conditions.

Winds blowing toward these storm centres often come from the east and south and therefore from the ocean. Thus the east and south winds bring vapor for clouds and rain. The south winds are also warm, for they come from warmer regions. Therefore, even in midwinter, when the south wind blows, a snowstorm may change to rain and a thaw set in. In summer the south wind brings warm, humid air and causes the most oppressive of summer weather. On such days thunder showers may develop. On the other hand, when the wind blows from the north or west, the weather is dry and cool in summer or cold in winter, because the air is then coming from the land.

There are frequent and often sudden changes in the weather, because the wind, influenced by the cyclonic storms, blows first from one quarter, then from another.

But, thanks to the cyclonic storms, winds from the ocean are caused often enough to supply the state with sufficient rainfall for agriculture. The heaviest rainfall is in the highland region and near the coast; the lightest is in the interior and on the lee side of the highlands. In no part of the state is the rainfall less than twenty-five inches, which is ample for crops.

Since New York lies in the cooler temperate latitude, the climate is everywhere cold in winter and warm or hot in summer. The lowest temperatures are naturally found among the highlands, especially in the Adirondacks (the highest mean annual temperatures are near the coast where the ocean moderates the climate). The water of the lakes, even of the Finger Lakes of central New York, also influences the climate. Near the lakes, especially near Lakes Erie and Ontario, the summer is made cooler and the winter warmer by the influence of the water. This makes it possible to raise grapes on a large scale along the Erie shore. For the same reason there is extensive grape-raising along the other lakes, as, for example, Lake Keuka.

Valleys are warmer than the neighboring hilltops, partly because they are lower and partly because they are so enclosed that the warmth is confined, as it is, for example, in a sunny street enclosed between walls of buildings. For this reason, although so far north, tobacco culture is carried on in some of the valleys; and for this reason also, in addition to the influence of the water, the Hudson valley has so warm a climate that fruit-raising is a very important industry there.

*While the prevailing winds are from the west, the cyclonic storms cause frequent changes. Owing to these storms there is an abundance of rain in all parts of the state. The climate is*

*everywhere cold in winter and warm in summer, but there are many variations, owing to different elevations, the neighborhood of bodies of water, and the influence of the enclosing walls of the valleys.*

REVIEW QUESTIONS. — *Physiography and natural resources.* Locate (Figs. 1 and 5) the Adirondacks. What is the reason for the height of the Adirondacks? Tell about lumbering and lumber products. Tell about the lakes of the Adirondacks. Give reasons for reserving forest tracts. Why do people go to the Adirondacks? What mineral products are found? Tell about the mountain region of eastern New York: its location; geological history; the Palisades; the industries. Tell about Long Island: its surface features; its origin; the terminal moraine; the industries. How do the Catskills differ from the Adirondacks? Why are they so high and rugged? What are the industries? Describe the surface features of the plains and plateaus of central and western New York. Where is the highest land in this region? Why? Into what two plains is the northern section divided? By what? What about agriculture and lumbering? What mineral products are found? Tell about the drainage of the state: rapids and falls; lakes; principal river systems. What have been the effects of the sinking of the land? How was the terminal moraine formed? What is till? What are some of the proofs of a former glacier? What influence did the glacier have upon the soil? Upon rivers in forming falls? Apply this to the formation of Niagara Falls. What influence had the glacier upon lakes? Tell briefly how the glacier made the Erie Canal possible. Give as many ways as you can in which the glacier has been of great importance to New York State.

*Climate.* In what wind belt does New York lie? State the influence of the cyclonic storms upon temperature. State this influence upon rainfall. What other reasons are there for variation in climate? How do these variations influence agriculture?

## History

Again and again in the study of the geography of the various countries we have seen that physiography influences the occupations of people and the location of cities. The *history* of a region is likewise profoundly influenced by the location of its mountains, lakes, and large valleys. In no one of the United States is this influence more clearly shown than in New York, where the broad Hudson-Champlain depression and the Mohawk valley have served as natural pathways.

Because of the fine harbor, a flourishing colony, now the second city in the world, grew up on New York Bay. The Hudson formed such an excellent route for travel that traders and settlers quickly reached and occupied the whole eastern part of the state, as far north as the mouth of the Mohawk. Through the gap cut by the Mohawk, traders and settlers found an easy path westward to the interior of the state and to the Great Lakes, as the Indians had done before them. At the north is the valley of Lake Champlain, Nature's gateway between Canada and New York. These natural routes have made New York State a battle ground in eleven different military campaigns in four wars. Notice on the map, Figure 15, how many forts were located in these two valleys and how many battles occurred there.

The first important European exploration of New York was that of the Frenchman, Samuel de Champlain, who entered from the north and whose name is given to the lake which he discovered. Two months later, in the same year (1609), the Dutch ship, *Half Moon*, seeking a northwest passage to China, sailed up the river which was thenceforth

called the Hudson, after her English commander, Henry Hudson. But since Hudson was in the service of Holland, this territory was claimed by the Dutch, although the English also claimed it as a part of their New England colonies.

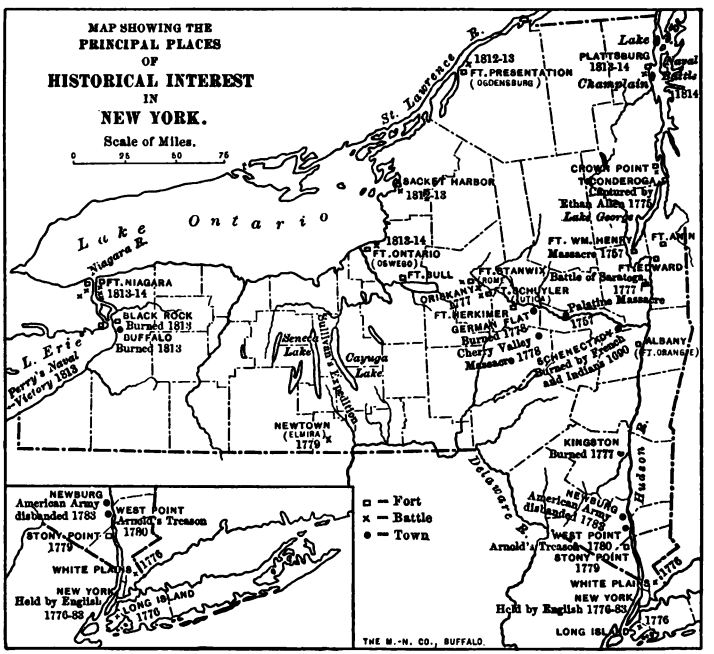



FIG. 15.

Name the forts (*a*) in the Hudson valley; (*b*) near Lake George; (*c*) in the Champlain valley; (*d*) in the Mohawk valley. Locate Crown Point, Ticonderoga, Ft. Ontario, Ft. Stanwix, West Point, Stony Point, Ft. Niagara. Where were battles fought in the war of 1812–1814? Where was the scene of Sullivan's expedition? Where was the American army disbanded in 1783? What cities have grown up on the sites of former forts?

The white man found in central New York a powerful union of Indian tribes called the *Five Nations* (Fig. 16). Owing to the number of their warriors and to the natural strength of their position, which controlled the Mohawk and other important valleys, the Five Nations formed the strongest body of Indians in America.

The island of Manhattan, on which New York City stands, was sold to the Dutch by the Indians for $24, being at the rate of $1 for a thousand acres. Dutch farmers settled the Hudson and Mohawk valleys, and trading-posts were established at various points, the two largest being Fort Orange, near the present site of Albany, and New Amsterdam, now New York. Among the Dutch settlers the wealthiest had great estates along the Hudson. These men were called *Patroons*, and from them sprang some of New York's most noted families.

In 1664 the English secured possession of the Dutch colony and called it New York after the Duke of York. This conquest settled the question of Dutch control in North America; but the Indians and French were yet to be overcome. When war between France and England broke out in 1754, New York naturally became the chief battleground of the war in America, since the French then occupied Canada. The easiest way for the English to invade Canada was by the Lake Champlain doorway; and this was also the way which the French chose for invading the English colonies. Thus their armies met on New York soil, and around Lakes George and Champlain many battles were fought (Fig. 15). Niagara, Oswego, and the Mohawk valley were also the scenes of conflicts. The English were at last successful, and not only saved New York, "the key to the continent," but also took possession of Canada.

During the Revolutionary War, New York again became a centre of the struggle, and New York City fell into the hands of the English at the outset. Around the

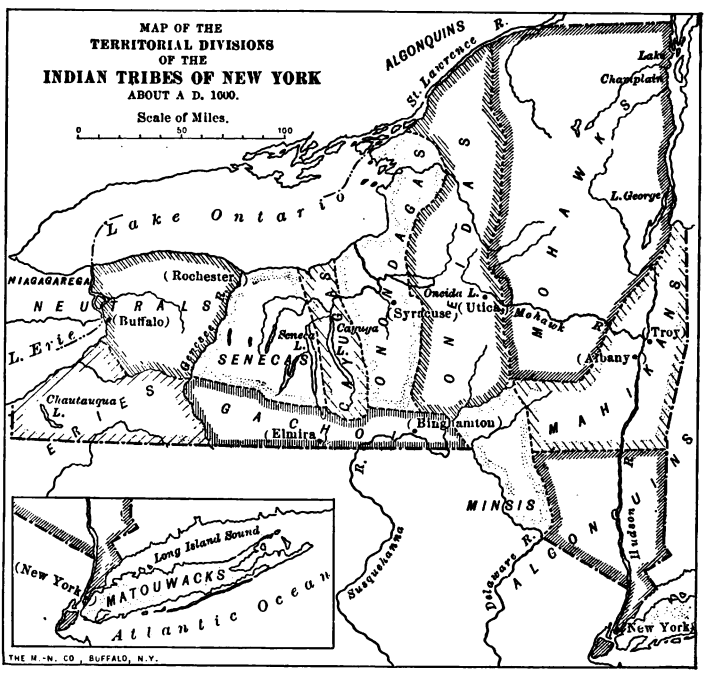



FIG. 16.

The Five Nations mentioned on the preceding page are the Mohawks, Oneidas, Onondagas, Cayugas, and Senecas. What names in New York geography were derived from these tribal names?

forts on Lakes George and Champlain and along the Hudson, some of the most important battles were fought. The capture of Fort Ticonderoga by Ethan Allen, and of Stony Point on the Hudson by "Mad Anthony" Wayne

are among the most daring exploits of the Revolution. In the upper Hudson valley, in 1777, the Americans gained one of the most important battles, the great victory of Saratoga (p. 64). It was the turning point in the Revolutionary War, for it brought to the Americans the foreign aid which they so much needed.

After the War for Independence had been won, New York City became the first capital of the United States, and here Washington was inaugurated first President in 1789. The city then had a population of thirty-three thousand.

In our second war with England, the War of 1812, New York again became a seat of conflict. On Lake Champlain Commodore Macdonough won a victory against the English fleet; and on Lake Erie, off the Ohio shore, Commodore Perry gained a still greater victory. Battles were fought along the Niagara River, at Oswego, Sacket Harbor, Ogdensburg, Buffalo and elsewhere.

In the meantime settlers had been pushing westward and were clearing the forests from the rich farming lands of central and western New York. But the lack of opportunity for easy communication was one of the most serious drawbacks to the development of this portion of the state. For example, it cost from fifty to one hundred dollars a ton to carry freight from Albany to Buffalo. The need of better means of transportation led to the construction of the Erie Canal, one of the most important events in the history of New York (pp. 20, 57). When the canal was finished, in 1825, the cost of carrying goods from Albany to Buffalo fell to twenty dollars a ton, and since then it has been reduced to one dollar a ton.

About 1830 the period of railway building began. The first railway in the state extended from Albany to Schenectady, and wooden rails covered with hoop iron strips were used. This was the beginning of the New York Central Railway, now one of the finest in the world. About 1840 the Erie Railway from New York to Dunkirk was commenced, and its building did much to open up the southern tier of counties. This road was much more difficult to

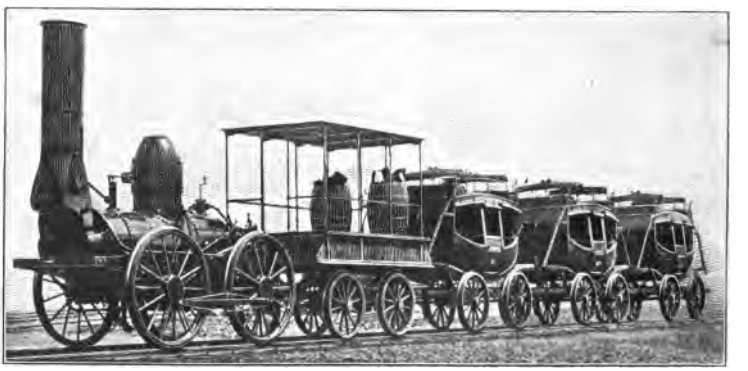
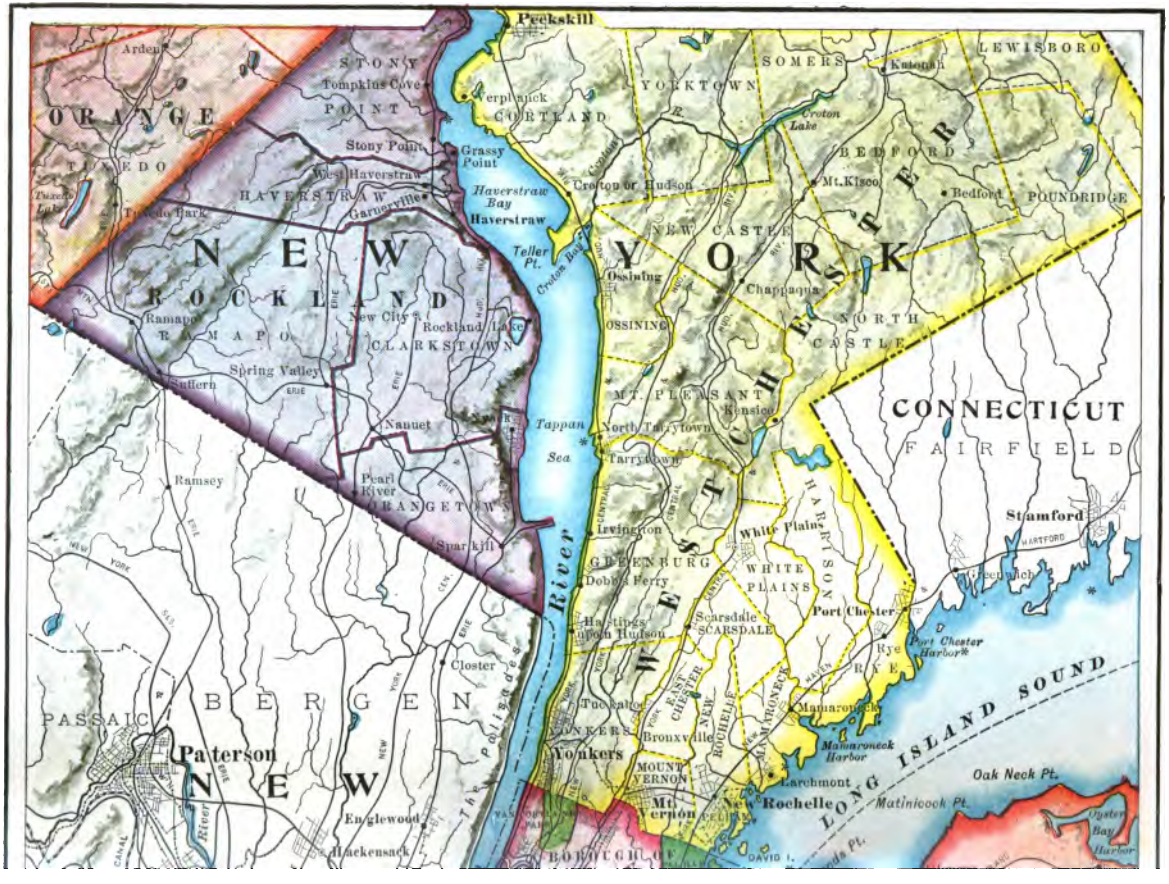


FIG. 17.

"The De Witt Clinton" and coaches. First train on the New York Central, 1831. (Copyrighted by A. P. Yates, Syracuse, N.Y.)

build than the New York Central. Why? From the beginning of the period of canal and railway construction to the present time New York has shown a wonderful growth in industry, wealth, and population.

REVIEW QUESTIONS. — What physical features of New York have especially influenced its history? Explain why the Champlain valley has been the scene of so many campaigns. How many? Tell what you can about Champlain and Hudson; the Five Nations; early Dutch settlements; the Patroons; the English occupation. In what


Peekskill
Arden
ORANGE
STONY POINT
Tompkins Cove
Verplanck
CORTLAND
YORKTOWN
SOMERS
Katonah
LEWISBORO
Stony Point
Grassy Point
West Haverstraw
HAVERSTRAW
Garnerville
Haverstraw Bay
Haverstraw
Croton Lake
BEDFORD
Mt. Kisco
Bedford
POUNDRIDGE
Tuxedo Park
Croton or Hudson
NEW CASTLE
YORKTOWN
NEW ROCKLAND
Teller Pt.
Croton Bay
Ossining
Chappaqua
Ramapo
RAMAPO
New City
Rockland Lake
CLARKSTOWN
OSSINING
NORTH CASTLE
Spring Valley
Suffern
MT. PLEASANT
Kensico
CONNECTICUT
FAIRFIELD
Nanuet
Tappan Sea
North Tarrytown
Tarrytown
Ramsey
Pearl River
ORANGETOWN
Irvington
White Plains
Stamford
Sparkill
GREENBURG
WHITE PLAINS
Greenwich
Dobbs Ferry
Port Chester
Hastings upon Hudson
Scarsdale
SCARSDALE
Port Chester Harbor
Rye
RYE
Closter
Tuckahoe
Mamaroneck
LONG ISLAND SOUND
PASSAIC
BERGEN
Paterson
Yonkers
Bronxville
MOUNT VERNON
Mamaroneck Harbor
Larchmont
Oak Neck Pt.
Mt. Vernon
New Rochelle
Matinicock Pt.
Englewood
Hackensack
BOROUGH OF BRONX
DAVID I.
Oyster Bay Harbor
Hudson River
The Palisades
NEW YORK
WESTCHESTER
HABERSHAM
EAST CHESTER
NEW ROCHELLE
MAMARONECK

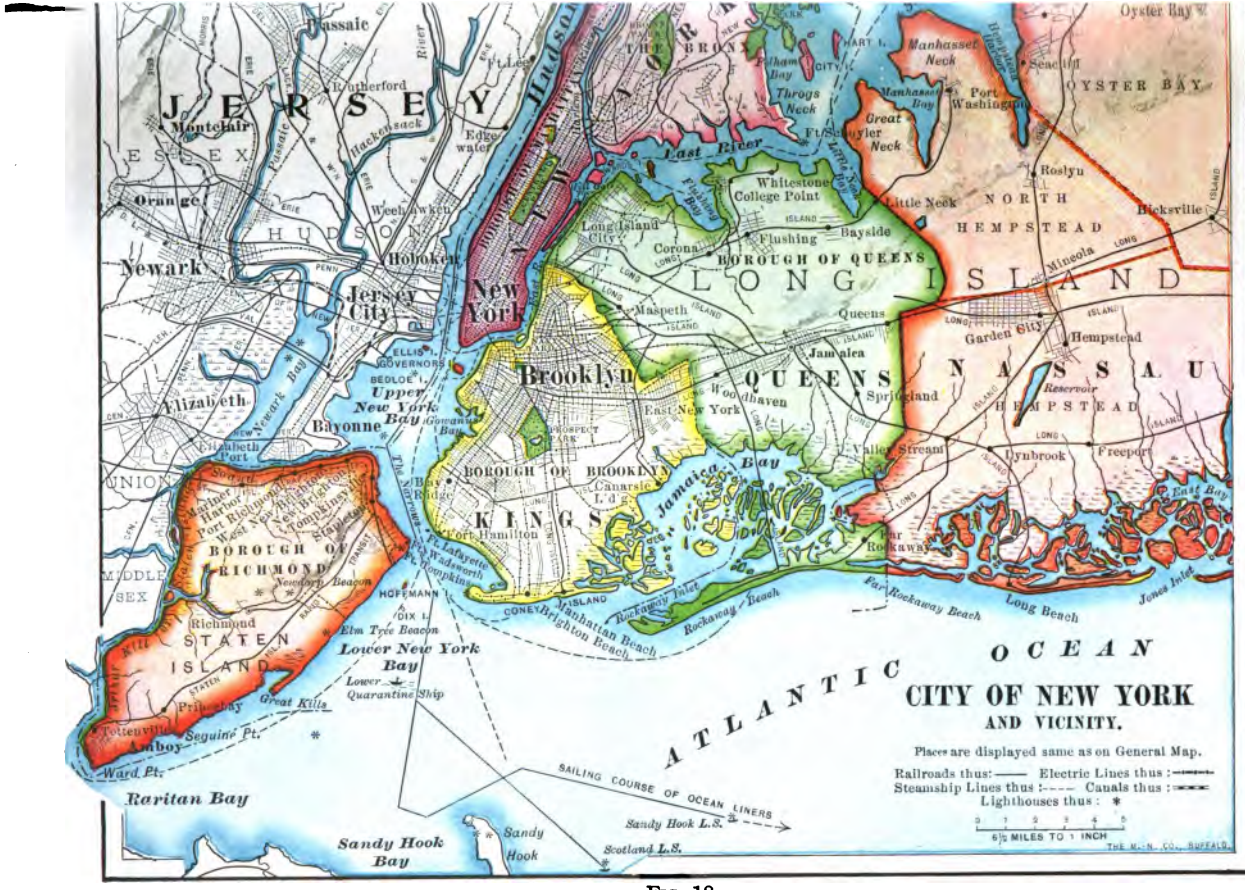

CITY OF NEW YORK
AND VICINITY.
Places are displayed same as on General Map.
Railroads thus: —— Electric Lines thus :
Steamship Lines thus :---- Canals thus :
Lighthouses thus : *
6½ MILES TO 1 INCH
THE M.-N. CO., BUFFALO.
ATLANTIC OCEAN
LONG ISLAND
NASSAU
QUEENS
KINGS
BROOKLYN
BOROUGH OF QUEENS
BOROUGH OF BROOKLYN
BOROUGH OF RICHMOND
STATEN ISLAND
JERSEY
NEW YORK
OYSTER BAY
NORTH HEMPSTEAD
HEMPSTEAD
Upper New York Bay
Lower New York Bay
Jamaica Bay
East Bay
East River
Raritan Bay
Sandy Hook Bay
Newark Bay
Long Beach
Jones Inlet
Far Rockaway Beach
Rockaway Beach
Rockaway Inlet
Brighton Beach
Manhattan Beach
Coney Island
Sandy Hook L.S.
Scotland L.S.
Sandy Hook
Ward Pt.
Seguine Pt.
Amboy
Great Kills
Prince Bay
Tottenville
Lower Quarantine Ship
Elm Tree Beacon
Fort Hamilton
Fort Lafayette
Fort Wadsworth
Fort Tompkins
Bay Ridge
Canarsie Ldg.
Flushing Bay
Throgs Neck
Great Neck
Manhasset Neck
Manhasset Bay
Port Washington
Seacliff
Oyster Bay
Roslyn
Bicksville
Little Neck
Whitestone
College Point
Bayside
Flushing
Corona
Long Island City
Maspeth
Queens
Jamaica
Woodhaven
East New York
Springfield
Valley Stream
Lynbrook
Freeport
Hempstead
Garden City
Mineola
Reservoir
Far Rockaway
Bayonne
Elizabeth
Elizabeth Port
Newark
Orange
Montclair
Rutherford
Passaic
Edgewater
Weehawken
Hoboken
Jersey City
Ellis
Governors
Bedloe
Gowanus Bay
Sandy Hook L.S.
SAILING COURSE OF OCEAN LINERS

FIG. 18.

portions of the state did the conflicts of the French and English wars take place? Why there? What important events took place in New York during the Revolutionary War? Name the important events in the War of 1812. Why was the building of the Erie Canal such an important event? What can you tell about the first railways of New York?

SUGGESTIONS. — Find out about the Dutch rule in New York. Learn more about the Patroons. Read chapters in Irving's "Knickerbocker History of New York." Suggest reasons why, by capturing the town of New Amsterdam, the English were able to control all the Dutch settlements. Write a composition on the battle of Saratoga; on the building of the Erie Canal. Read the story of Benedict Arnold's treason. Find out more about Commodore Perry's victory on Lake Erie. Collect pictures of historic places in New York. Make a historic map showing the location of old forts and battle grounds (Fig. 15). Learn some facts about the life and deeds of noted New Yorkers, such as Hamilton, Livingston, Clinton, Jay, Seward, Greeley, Van Buren, Fillmore, and Cleveland.

## NEW YORK CITY

MAP QUESTIONS. — (Fig. 18) What waters surround Manhattan Island? Long Island (Fig. 1)? Staten Island? Locate Jersey City; Hoboken; Sandy Hook. What counties form Long Island (Fig. 1)? Manhattan Island? Staten Island? How would you go by water from New York to Philadelphia? to Buffalo? to Montreal? What is the latitude and longitude of New York City? What large cities of the United States have nearly the same latitude as New York City? Compare the latitude of London, Paris, Madrid, Rome, and Peking with that of New York. Compare the distance by water from Montreal to Liverpool with that from New York to Liverpool.

**Advantages of Location and Causes of Growth.** — Most of the large cities of Europe were founded one or two thousand years ago. All of them were populous centres long before white men settled on Manhattan Island; yet, next to London, New York is the largest city in the world. What are the causes of this wonderful growth?

Chiefly *its location.* It is on one of the finest harbors in the world. It has many miles of water front, giving room for hundreds of docks and piers where ships may load and unload. The upper bay is connected with the ocean by three different channels. Name them (Fig. 18). Without this large, deep, safe harbor New York's enormous ocean commerce would be impossible; and it is interesting to remember that this splendid harbor is due to a simple geological cause — the sinking of the land (p. 14). This same sinking made the Hudson River the broad, deep waterway that it is, really an arm of the ocean; and it also formed Long Island Sound, thereby providing an enclosed waterway along which even small boats may safely carry on traffic with southern New England.


FIG. 19.

A relief map of New York harbor and vicinity. (Modelled by E. E. Howell, Washington, D.C.)

The gap cut by the Mohawk River (p. 19) made possi-

ble the Erie Canal; and this canal, by connecting the Hudson River with the Great Lakes, brought the commerce of the great West to New York. Thus New York became the seaport for the West, both for the shipment of its products to foreign countries and for the receipt of manufactured and other goods needed by the West.

The New York Central, Erie, and other railways reaching westward from New York still further increased the commerce of the city. These splendid facilities for shipping both by rail and water so encouraged manufacturing that New York became also the greatest manufacturing city of the New World. The opportunities for every kind of employment draw thousands of people there every year. With the growth of trade, manufacturing, and population, the wealth of the city so increased that the wealth now gathered in New York is far beyond anything which our minds can grasp. New York surpasses in this respect any other city, with the possible exception of London. It rivals even London as the money centre of the world.

**Divisions of the City, Area, and Population.** — Greater New York consists of

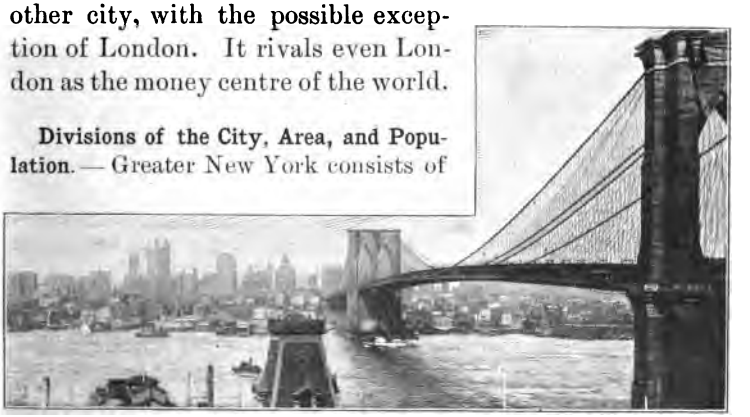


FIG. 20.

**Brooklyn Bridge, between Brooklyn and Manhattan boroughs. Across East River are seen the lofty office buildings of lower Manhattan (Figs. 23 and 27).**

five boroughs: (1) Manhattan, the heart of the city, occupying Manhattan Island; (2) Brooklyn, consisting of King's County on Long Island; (3) Bronx, the part of the city northeast of Manhattan; (4) Queens, including the county of Queens on Long Island; (5) Richmond, comprising Staten Island. Make an outline map to show these divisions of New York City (Fig. 18).

The city has a length of 37 miles, a width of 25 miles, and an area of about 360 square miles. Its population in 1900 was **3,437,202**. New York County has an average of 32,550 persons to the square mile (Fig. 65). On the other hand, Hamilton County in the Adirondacks has an average of less than 3, and the farming counties which have no cities average about 50 to the square mile (Fig. 65).

**Manufactures and Commerce.** — Its large population and its unequalled shipping facilities have so encouraged manufacturing that, in the value and variety of goods manufactured, New York far surpasses any other city of America. There are upwards of sixteen thousand manufactories, large and small, in the city, engaged in making almost every article which people use. There are over five thousand places devoted to making different kinds of clothing alone. But because land is so expensive and rents so high, the largest manufacturing plants cannot be found in the great cities. Hence, it is rather articles of high value, and whose manufacture requires a comparatively small amount of room, that are especially made in New York. However, in Brooklyn and in the outlying portions of greater New York are some large manufactories employing one thousand to fifteen hundred men each; for example, the Havemeyers' Sugar Refineries and the refineries of the Standard Oil Company.

New York is the centre of the printing and publishing

business of the country. It is the greatest importing and exporting city of the western hemisphere. Indeed, nearly as many ships load and unload their cargoes at New York as at all the other seaports of the United States together. This is particularly important when it is remembered that no other nation has such a large trade with foreign countries as the United States.

FIG. 21.

A scene at the docks near the Brooklyn bridge on the Manhattan side.

**Notable Sections of New York.** *The Piers, Wharves, and Docks.*— These shipping accommodations form a perfect fringe around the lower end of Manhattan and far up the sides of the island, especially on the west (Fig. 21). There are also many piers in Brooklyn, and they are all scenes of bustling activity. Here are ponderous freight steamers unloading the products of every country under the sun: others are receiving their cargoes of wheat, corn,

meat, and numberless other commodities which we send to foreign countries. Streams of people are pouring from the long, graceful passenger steamers; drays and trucks, some piled high with mailbags, others with express and baggage, are struggling to get to and from their piers. Ferry boats are plying back and forth between the different parts of New York and the cities on the New Jersey side; and the bay swarms with crafts of every kind, all busy with the city's commerce.

FIG. 22.

A scene in Broadway. (Copyrighted by Geo. P. Hall & Son, N.Y., 1900.)

*Business Sections* (chiefly Manhattan Borough). — There is a notable tendency of business houses engaged

in the same line of business to collect in groups. This acts both to the convenience of the public and of the tradesmen. For example, most of the newspaper publishing houses are grouped on "Newspaper Row." The banks, brokers' offices, and money lenders are along the famous Wall Street. Other sections are devoted respectively to the leather trade, to the silk trade, to jewellery, to second-hand clothing, and to school-book publishing.

FIG 23.
The Park Row Building. (Copyrighted by Geo. P. Hall & Son, N.Y., 1900.)

Broadway and Fifth Avenue are New York's most noted thoroughfares (Fig. 22.) On or near them, in a section south of Central Park, are grouped many large hotels and theatres. In this section is the Grand Central Depot, the terminus of the New York Central Railway. So valuable is land, that the buildings are densely crowded together and built to great heights, sometimes nearly

thirty stories high, as for example the Park Row Building (Fig. 23).

*Residence Sections.* — Thousands of New York business men live outside of the city, sometimes as much as forty miles away, going to and from their business by train or trolley line. Suggest reasons for this. Many live in Brooklyn, which has always been a residence city for New York business men. Some wealthy persons prefer to live at the fashionable hotels, while others have beautiful residences, especially on Fifth Avenue. The middle and upper portion of the island is largely a residence section, and for mile after mile the fronts of the buildings form a solid wall from one cross-street to another. A dozen or more families may occupy a single apartment house or "flat" building, and land is far too valuable to admit of yards.

The southeast portion of Manhattan, called the "East Side" (Fig. 24), is largely a residence section for foreigners. Here the people are huddled together in masses, even a whole family sometimes living in a single room. In a single square mile on the East Side there are forty thousand school children. Foreigners collect here by nationalities, and there are the "Italian Quarter," the "Chinese Quarter," the "Jewish Quarter," and many others. Much crime is committed in this section, and there is much suffering. But public day schools, evening schools, missions, parks, gymnasiums, recreation piers, free baths, etc., are gradually improving the condition of the people.

**Life in a Large City.** — Life in a great city necessarily differs widely from life in the country. Contrast the following account of the conditions in one of the residence districts of New York with that given on page 97.

The family occupies a flat of six or eight rooms, paying a monthly rent ranging from twenty-five to one hundred and fifty dollars. Above, below, and on both sides, are other families

who often know as little of one another as if they lived miles apart. They may thus live in the same house for years and

FIG. 24.

A scene on the East Side.

not even know one another's names, although all the apartments are heated from the same furnace, which is tended by a hired janitor. The water which they use comes in pipes to their

rooms; and their light is supplied either by gas or by electricity. Their mail is collected and delivered several times daily by postmen in uniform. The family buys its vegetables and fruit in small quantities, perhaps a half peck of potatoes at a time, for it owns no land on which to raise them, and has no space in which to store them. Milk is brought to the door every morning, having come to the city on milk trains. All refuse material is taken from the basement doors by the city garbage wagons.

FIG. 25.
An elevated railway in New York.

The children play in the street, since they have no yards, and go to school in enormous buildings that accommodate perhaps thirty or forty teachers and two thousand pupils each. If they wish to be among trees and birds, they may need to go two or three miles to a park. If they wish to visit a friend in another part of the city, or if they wish to go to shop, they take a street car or elevated train and their route lies over paved or asphalted streets which are swept in summer, and cleared of snow in winter, by city employees. For months at a time one may not

see friends who live in another part of the city. Such are some of the features of life in New York.

**Borough of Brooklyn.** — Until 1898, Brooklyn was a separate city and ranked fourth among the cities of America. Because of the number and beauty of its church buildings it received the name of "City of Churches." It has many stores and much business of its own, though a large part of its population is made up of families whose support comes from work in Manhattan borough. The largest of the United States navy yards is at Brooklyn.

**Other Interesting Facts about New York.** — New York is, before all else, a business city. Among its citizens are many of the most famous business men of the nation, as well as many of America's greatest lawyers, physicians, and clergymen. In fact, the opportunities for superior ability of every kind which New York offers are drawing to it a liberal portion of the best intellect and energy of the country.

It is also a centre of culture, refinement, and art. New York has more than twenty art galleries open to the public. The Metropolitan Museum of Art in Central Park is the largest and finest in America. New York is the seat of Columbia University (Fig. 26) and the University of the City of New York. More than fifty parks, large and small, are free to the public. The most celebrated is Central Park, with nine miles of driveways and twenty-eight miles of walks ; with lakes, woods, museums, zoological gardens, and scores of other means of enjoyment and education. Its great length, in the heart of the city, makes it possible for immense numbers of people to easily

FIG. 26.

A view of the Columbia University Library and other buildings. The Hudson River and Palisades are in the background. (Copyright by G. P. Hall & Son, N.Y., 1898.)

reach it. At Riverside Park, on the bank of the Hudson, is the beautiful tomb in which General Grant is buried.

Such crowds of people are passing from one part of the city to another at night and morning that the thousands of street cars, elevated railway trains, and ferry boats are scarcely able to accommodate them. This crowded condition is well illustrated on Brooklyn Bridge (Figs. 20 and 21), over a mile in length, which connects Manhattan and Brooklyn boroughs, and over which, both on foot and on elevated trains, streams of people are constantly passing. How to provide accommodation for so many people is one of the most difficult problems in New York. When street cars and ferry boats were insufficient, the extensive system of elevated railways was constructed; and now an underground railway is added to the means of providing for the transportation of the people about the city.

The residents of New York include people from practically all the nations of the earth. The large number of foreigners may be indicated by the following statement. Counting those born in foreign countries and their chil-

dren, there are more Jews in New York than in Palestine, more Irish than in Dublin, more Germans than in Hamburg, and more Italians than in Venice.

**Summary.**—New York has become the greatest city of America because of its facilities for commerce. The excellent harbor, the deep Hudson River connected with the Great Lakes by the Erie Canal, and the great trunk line railways terminating on the shores of the harbor, have made New York the chief seaport for the whole

FIG. 27.

St. Paul's Church, where Washington worshipped. (Copyright by G. P. Hall & Son, N.Y., 1900.)

interior of the United States. It is also our chief manufacturing, commercial, and banking city.

Life in this great city is in many ways interesting and peculiar and differs widely from that in the country. Men may live miles from their places of business; and neighbors, separated only by a thin partition, may not know one another. More people may live in a single building, or more children may go to a single school, than live in an entire village in the country. So many persons living near together cause land to be so valuable that lofty buildings are erected and space is wanting for yards and gardens. Extensive systems of transportation are necessary, and to attend to the government and business of the city thousands of officers are required. This dense population includes people from many nations; in fact, half of New York's population is of foreign birth or parentage.

**The Environs of New York City.** — Just across the Hudson, in the state of New Jersey, are several cities which are closely associated with New York. Among them are JERSEY CITY and HOBOKEN, which are almost as much a part of the metropolis as is Brooklyn. The great trunk line railways from the West and South cannot enter New York directly because as yet no bridge has been built across the river near this point. And the various divisions of the New York Central from New York State and from New England are the only railways which enter Manhattan. The others terminate on the New Jersey side, and their passengers and freight are transferred to New York by means of ferry boats. Thus Jersey City and Hoboken may be called the railway stations of New York. Thousands of the people who do business in the metropolis reside in New Jersey and go to and from home daily by train and ferry.

Long Island and the counties of southeastern New York, particularly Rockland, Westchester, Orange, and Putnam, also stand in close relation to New York City.

The many thousands of New York people who prefer to have their homes outside the city have caused this part of the state to become densely populated. Here are the cities

**Fig. 28.**

**Bottling milk in Delaware County to be sent to New York City.**

of Mount Vernon, New Rochelle, Yonkers, Newburgh, and Middletown. Among the larger villages are Fishkill, Peekskill, Port Jervis, White Plains, Nyack, and Port Chester. Locate each of these on the maps (Figs. 1 and 18). In the vicinity are Ossining, in which is located the well-known Sing Sing state prison; Stony Point, made illustrious by "Mad Anthony" Wayne's

exploit in Revolutionary times; West Point, with its United States Military Academy for training officers for the army; and Sunny Side, the home of one of our greatest American writers, Washington Irving.

NEWBURGH is to be remembered as the place where Washington had his headquarters and where the American army was disbanded at the close of the Revolutionary War. YONKERS has one of the largest manufacturing plants in the state, employing five thousand persons in making carpets and yarn. All of the other cities and villages have manufacturing industries.

The hilly land away from the river provides pasturage for great numbers of milch cows; and as Long Island is one of New York's vegetable gardens, so the southeastern counties are its dairy farm. The milk is put chiefly in bottles (Fig. 28) and sent to New York City. Not only are the vast majority of the people within fifty miles of New York constantly working to supply the needs of the millions in the city, but the farmers, manufacturers, planters, and ranchmen throughout our broad country find in New York a market for a part of what they produce.

REVIEW QUESTIONS. — What causes have made New York the metropolis of North America? Why is it especially adapted to commerce? What portion of the nation's exports and imports passes through New York? Name and locate the boroughs of New York. Tell all you can of the history of the city. Tell about its manufactures; scenes at the piers; its business sections; its residence sections. Why are buildings so crowded together and so tall? Where is the leading hotel and theatre section? The foreign section? The wholesale trade section? What can you tell about Fifth Avenue? Broadway? The East Side? Central Park? Wall Street? Brooklyn? Life in New York? Name some places of interest not already mentioned. Tell about the environs of New York, especially the occupation of the people and the location of the cities.

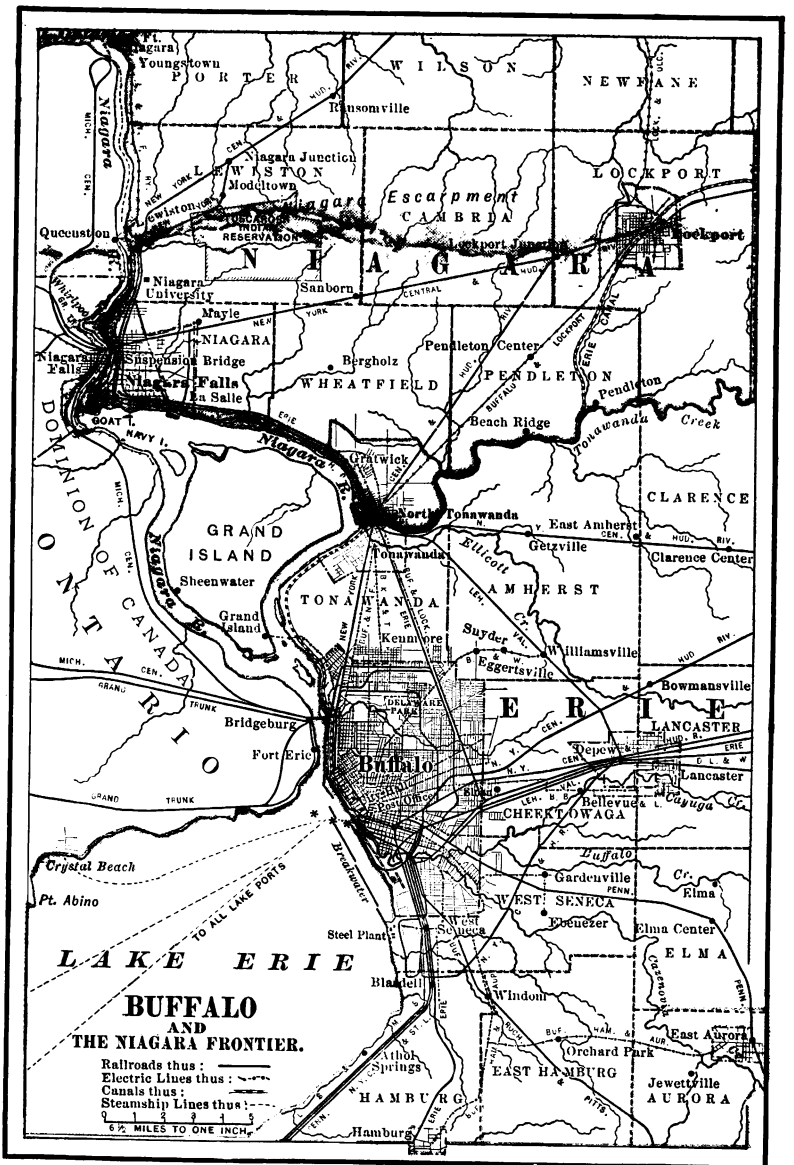

BUFFALO
AND
THE NIAGARA FRONTIER.
Railroads thus :
Electric Lines thus :
Canals thus :
Steamship Lines thus :
6½ MILES TO ONE INCH
LAKE ERIE
TO ALL LAKE PORTS
Breakwater
Crystal Beach
Pt. Abino
Steel Plant
Blasdell
Athol Springs
HAMBURG
Hamburg
Ft. Niagara
Youngstown
PORTER
Ransomville
WILSON
NEWFANE
Niagara Junction
LEWISTON
Model Town
Lewiston
Queenston
Niagara Escarpment
TUSCARORA INDIAN RESERVATION
CAMBRIA
Lockport Junction
LOCKPORT
Lockport
NIAGARA
Niagara University
Sanborn
Mayle
NIAGARA
Suspension Bridge
Niagara Falls
Niagara Falls
La Salle
Whirlpool
GOAT I.
NAVY I.
Bergholz
WHEATFIELD
Pendleton Center
PENDLETON
Pendleton
Beach Ridge
Tonawanda Creek
Gratwick
North Tonawanda
East Amherst
Getzville
CLARENCE
Clarence Center
Ellicott Cr.
AMHERST
Tonawanda
TONAWANDA
Kenmore
Snyder
Eggertsville
Williamsville
Bowmansville
GRAND ISLAND
Sheenwater
Grand Island
Niagara R.
DOMINION OF CANADA
ONTARIO
Bridgeburg
Fort Erie
Buffalo
DELAWARE PARK
Post Office
ERIE
LANCASTER
Depew
Lancaster
Sloan
Bellevue
CHEEKTOWAGA
Cayuga Cr.
Buffalo Cr.
Gardenville
WEST SENECA
Ebenezer
West Seneca
Elma
Elma Center
ELMA
Cazenovia
Windom
Orchard Park
EAST HAMBURG
East Aurora
Jewettville
AURORA
NEW YORK CEN. & HUD. RIV.
MICH. CEN.
GRAND TRUNK
ERIE
LEH. VAL.
PENN.
D. L. & W.
BUF. & LOCK.
BUFFALO & LOCKPORT
ERIE CANAL
N. Y. C. & ST. L.
BUF. HAM. & AUR.
PITTS.

FIG. 29.

## BUFFALO AND VICINITY

MAP QUESTIONS. — (Figs. 1 and 29.) How can one go by water from Buffalo to Chicago? to Duluth? to Montreal? to New York City? In what county is Buffalo? By reference to the scale of miles estimate the distance from Buffalo to Niagara Falls; to Rochester; to New York; to Cleveland, Ohio. By what railways could one go from Buffalo to New York? How many hours would it take? By what railway or railways could you go from your home to Buffalo? What canal terminates at Buffalo? Why should our government maintain a fort at Buffalo and not at Syracuse? On the map (Fig. 29) locate Tonawanda, North Tonawanda, Niagara Falls, and Lockport. What is the nearest water route from Buffalo to Liverpool, England?

**Buffalo.** — In size Buffalo is the second city of New York State and eighth in the United States. It is natural that we should next study about this great city which stands at the opposite end of the chain of water and railway communication which extends across the state. Its position and growth depend upon some of same causes which have determined the importance of New York City.

From a population of one white man in 1789 and of 1500 in 1812, Buffalo has become a city of 352,387 in 1900. Many of the cities and villages of eastern New York are much older ; in fact, some of them were a century old when the first white man settled on "Buffaloe Creek." Yet aside from New York City, Buffalo has surpassed them all. This is not because the people of these eastern towns are necessarily less enterprising than Buffalo people. "Men do not make cities, they grow."

Buffalo is a great city because it is natural that a great city should grow up at the eastern end of Lake Erie. Here is the western terminus of the Erie Canal and the eastern terminus of that splendid natural waterway, the Great Lakes. The best of farming lands, the most valuable

of forests, and the richest iron mines of the world are around these lakes (Fig. 30). In earlier years, because there were few railways into the West, and later because transportation by water is cheaper, the lake route has been the chief outlet for these mines, forests, and farms. Boats of course could not pass Niagara Falls, but they could transfer their cargoes to canal boats and railways for reshipment to the seacoast and the cities of the East.


FIG. 30.

**Some of the raw materials which are readily brought to Buffalo by boat.**

Two hundred and twenty-five million feet of lumber, two hundred million bushels of grain, one and a half million tons of iron ore, and sixty-six thousand carloads of live stock are a portion of Buffalo's enormous yearly receipts from the West; and the city is one of the most important markets for horses in the United States. This commerce has called for lumber yards, grain elevators, ore docks, stock yards, and thousands of laborers. Here is the Lackawanna trestle, a mile in length and one of the largest coal trestles in the world. Here are over forty grain elevators (Fig. 31), tall tower-like structures in which the grain is stored for reshipment. For the safety of ships engaged in loading and unloading, a breakwater encloses the harbor on the waterside.

Railways seek commercial centres and then in turn make them still greater centres of trade. Buffalo's natural facilities for commerce early attracted railways to the city ; then the railways caused Buffalo to grow still more rapidly. Twenty-eight railways now enter the city.

The nearness of the rich coal fields and oil fields of Pennsylvania, sources of fuel, light, and power, has added much to the growth and importance of Buffalo. North

FIG. 31.

**Elevators at the water front of Buffalo.**
**(Copyrighted by Geo. P. Hall & Son, N.Y., 1899.)**

of the city are the Niagara Falls, a part of whose enormous water power is being converted into electrical power and used to run the street railways and much of the machinery of Buffalo.

There are now in the city more than three thousand manufactories, with one hundred thousand employees. The most noteworthy manufactures are pig iron, cars, leather, starch, soap, flour, linseed oil, fertilizers, and chemicals. Meat packing is another important industry.

Buffalo has one office building, the Ellicott Square Building (Fig. 32), occupying an entire city square. This may be taken as a type of the office buildings of a great city. It contains forty stores, sixteen counting rooms, six hundred offices, sixteen elevators, splendid club rooms, and a large, open, central court. Its cost was nearly three and a half million dollars; yet such perfection has the building trade reached in America, that from the day that the workmen began tearing away the old buildings on the site until the finishing touch was added, exactly one year elapsed.

FIG. 32.

The Ellicott Square Building in Buffalo. This building is ten stories high, and contains 447,000 square feet of floor space, equal to that of a thousand ordinary schoolrooms. Between three and four thousand people are daily employed here.

To the south and west of Buffalo are scores of gas wells, from which gas is conveyed in pipes to all parts of the city to be used for fuel and lighting. The miles of asphalt pavement, the beautiful homes, parks, and drives, the university and normal school, combine with many other features to make Buffalo an attractive residence city. The influence of the lake in so moderating the summer climate as to make most of the summer days delightfully cool still further increases its attractiveness in this respect. Buffalo has lately attracted attention by the Pan-American Exposition of 1901, which was planned by her enterprising citizens.

**Niagara Falls and the Tonawandas.** — The cities of Niagara Falls and North Tonawanda and the village of Tonawanda are intimately connected with Buffalo. Note their location on the map (Fig. 29).

The Niagara Falls are capable of furnishing the greatest water power in the world, for a million tons of water fall over them each minute. A part of this power is now being used, though only a small part. By means of a canal some of the water of Niagara River is conducted

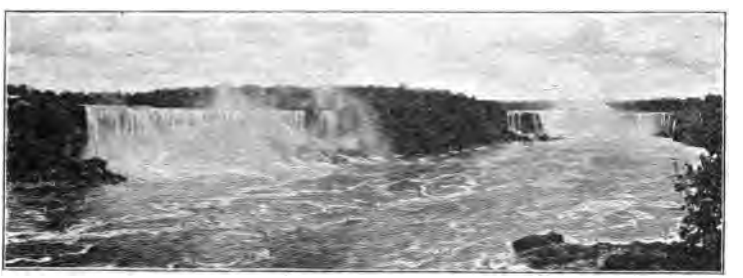


FIG. 33.

**A view of Niagara Falls — the American fall on the left, the Canadian or Horseshoe fall on the right. (See also Fig. 13.)**

around the falls and into vertical tubes eight or ten feet in diameter extending one hundred and fifty feet into the ground (Fig. 34). At the bottom of each of these tubes is a water wheel, against which the great volume of water strikes, causing the wheel to revolve with tremendous force. The power of a single wheel equals that of five thousand horses, and four hundred thousand horse power can be supplied by the works now planned on the American side. By means of dynamos the water power is changed into electrical power and is then conducted by wires to various points where it is

wanted. Much of it goes to Buffalo (p. 49). The electrical power thus developed is so cheap and so convenient that numerous large manufacturing establishments are already located at the city of Niagara Falls, and it is reasonable to believe that this vicinity will become one of our most important manufacturing centres.

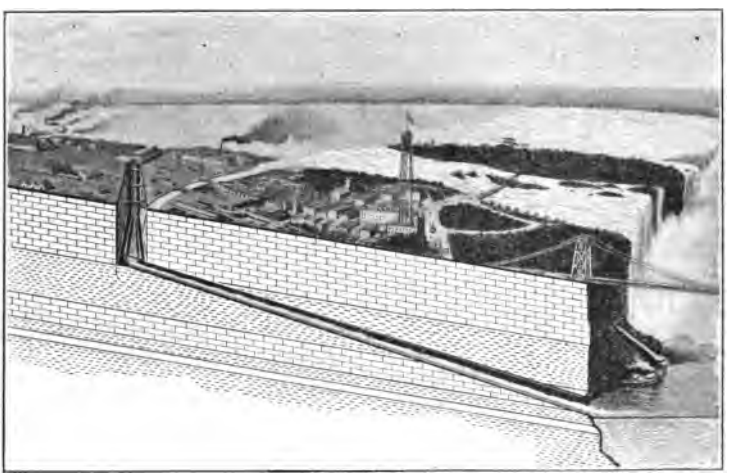


FIG. 34.

A section to show how the Niagara power is used. The wheels are placed at the base of the tube on the left-hand side, and the waste water then runs down through the tunnel and back into the river.

NORTH TONAWANDA is a lumber market of national importance. Its situation on Tonawanda Creek where it enters the Niagara River near Lake Erie gives it six miles of water front and furnishes excellent facilities for shipping, which are increased by the fact that the Erie Canal passes through the city. Much manufacturing has natu-

rally developed in a city with such a location, to which both coal and iron, as well as lumber, can be brought so cheaply.

Buffalo and its neighboring towns seem likely to develop into one of our greatest inland centres of population, manufacturing, and commerce. In that case North Tonawanda, lying between Buffalo and Niagara Falls, may come to blend with these two cities.

**Summary.** — The importance of Buffalo as a commercial city was formerly due to its position at the junction of Lake Erie and the Erie Canal. As railways took the place of canals, Buffalo naturally became a great railway centre. Vast quantities of iron ore, grain, lumber, and other products are unloaded from boats at Buffalo to be shipped elsewhere by rail. Buffalo has over forty grain elevators, extensive coal and ore docks, large stock yards, over three thousand manufactories, and twenty-eight railways connecting it with all parts of the United States and Canada. Next to New York, it is the chief manufacturing and commercial city of the state. Closely associated with Buffalo are the cities of North Tonawanda and Niagara Falls. The former is a great lumber market; the latter has varied manufacturing industries largely because of the tremendous water power of the falls, which is in part being harnessed and converted into electrical power.

Review Questions. — Show how the situation of Buffalo accounts for its rapid growth. In what way is Buffalo closely related to New York? Why are grain, lumber, and iron ore so extensively shipped on the lakes rather than by rail? Why do most of the boats unload at Buffalo instead of going on to Lake Ontario? What are the chief articles that are shipped to Buffalo from the West? Tell about Buffalo as a railway centre. What are its leading manufactures? For what is North Tonawanda noted? Tell all you can about Niagara Falls and its water power (see also p. 18).

## THE HUDSON VALLEY

MAP QUESTIONS (Figs. 1, 29, and 51). — Where does the Hudson river rise? What is its main branch? Where is the Hudson valley widest? About how long is it (use scale of miles)? Name the counties on the east bank; on the west bank. Locate Yonkers, Poughkeepsie, Albany, Troy, Newburgh, Hudson, Kingston, Watervliet, Cohoes, Saratoga Springs, Glens Falls. What railways run near the Hudson from Albany to New York?

**Its Importance.** — Between Buffalo and New York, along the Hudson and Mohawk valleys and the Erie Canal, there is a chain of cities and villages with many diverse industries. Like New York and Buffalo these cities owe their start and much of their prosperity to the canal which opened up communication both with the sources of raw materials and the markets for manufactured products. The Hudson is an important part of this water route. Before the Glacial Period, when the land in this part of New York was higher than now, a stream of no great size flowed southward across the worn-down mountain region of the southeast (p. 6) and cut a valley rather narrow and deep. Where the rocks were hard this valley was narrow, as at the Palisades (Fig. 6); where they were softer it was much broader, as at the Tappan Sea.

When the land sank (p. 14), it admitted the sea into the Hudson valley and changed it to a deep estuary, navigable for nearly 150 miles. Therefore the Hudson is not a true river, but an ancient valley into which the tide rises as far as Troy. It is an arm of the sea. South of Troy the only noticeable current is that produced by the incoming and outgoing tide.

It is difficult to appreciate how great an influence the Hudson River, together with the Mohawk, has had in

making New York the Empire State. Not only is it in itself an artery of commerce between the interior of the state and the seaboard, but it forms a part of that waterway (p.32) which for years brought to New York City half the surplus products of the nation.

In a country of hills and mountains, railways must follow stream valleys to secure easy grades. Therefore the Hudson and Mohawk valleys not only made possible the Erie Canal, but they furnished a most inviting route for railway building, and naturally one of the earliest railways was built along these valleys (p. 30). This was the New York Central and Hudson River road, which follows the course of the Erie Canal from New York to Buffalo. This railway system, which includes the West Shore line, is one of the finest railways in America. The two parallel tracks of the Central are on the east side of the Hudson, and the two tracks of the West Shore are on the west bank; and from Albany to Buffalo the New York Central has four tracks.

**The Lower Hudson.** — Along the banks of the Hudson are numerous extensive beds of clay; and the demand for brick in New York City, the nearness of the clay beds, and the opportunity for cheap transportation of the brick in boats on the navigable Hudson have made this the greatest brick-making section in the world (Fig. 9). More than a billion bricks are made there each year.

The quarrying of flagstone is another extensive industry in this part of the state, especially in Ulster County, where there are over five hundred quarries (Fig. 9). These flagstones are used for the sidewalks of New York and other nearby cities and villages.

The cheap transportation by water, the excellent railway facilities, the nearness to the coal regions, and perhaps, above all, the nearness to New York City, the greatest market of the nation, have united to make the Hudson and Mohawk valleys the chief manufacturing region of the state. Thousands of boatloads and carloads of brick, flagstone, cement, lime, and crushed stone are taken yearly from the lower Hudson valley to the metropolis. A large portion of the city's milk and ice comes from the farms and ice houses along the river. Large quantities of vegetables also come from this section. Of New York's forty-one cities, eleven are on the Hudson and there are a score of large and thriving villages. Name the eleven cities (see Map, Fig. 1).

FIG. 35.
Railway bridge across the Hudson at Poughkeepsie.

Midway between Albany and New York is POUGHKEEPSIE, a busy manufacturing city and the seat of Vassar College, one of the leading women's colleges of the United States. One of the few bridges across the lower Hudson is at Poughkeepsie (Fig. 35).

The city of KINGSTON was the first capital of the state. It is in the region from which great quantities of brick and cement or hydraulic lime are shipped. This cement, made by burning the limestone found in the vicinity, is used in the building of stone work which is to come

in contact with water, such as the piers of bridges, in which ordinary mortar cannot be used.

What cities below Kingston have already been mentioned (pp. 45 and 46)? For what are they important? Why should the largest two cities of the state be situated at the two ends of the water route?

**The Erie Canal.** — In 1807 there occurred on the Hudson River an event of vast importance, — the successful trip of the first steamboat, Robert Fulton's *Clermont*, from New York to Albany. It soon became evident that steamboats could be used to draw other boats. Already the great value of a canal between Lake Erie and the Hudson River was evident to a few leading men, and when it was seen that canal boats could be drawn on the Hudson River by a steam tug, the "canal scheme," as some called it, began to attract much attention.

In those years New York had a governor who was far-sighted, determined, and courageous; a man who, in spite of great opposition, had the daring to undertake the building of the Erie Canal. This man was Governor De Witt Clinton. People who did not believe in the canal called it "Clinton's big ditch." Very soon after its opening, however, the wisdom of Governor Clinton and his friends was seen by all. The products of the region around the Great Lakes began to pour through the Erie Canal. Every kind of industry in New York State became more profitable, for whatever was raised or made there now had an easy means of reaching the people who wished to buy it. Cities and towns grew up along the canal, all of them deriving much of their prosperity from the commerce which was carried on over this water route. Now New York City is the metropolis of the New World;

and New York State is the richest, busiest, and most populous of the states. That the canal had much to do with this is seen from the fact that 80 per cent of the people and 90 per cent of the wealth of New York are in the counties along the canal and Hudson River.

**Albany, Troy, and Neighboring Cities** (Map, Fig. 51).—About 150 miles above the mouth of the Hudson River is a region naturally fitted to be a centre of population and industry. It is at the head of tide water and of steam navigation; at the junction of two large rivers; at the meeting point of the Erie and Champlain canals with the Hudson River; and at the intersection of two natural commercial routes, — the north and south route, formed by the Hudson and Champlain valleys, and the east and west, formed by the Mohawk valley and continued on into New England. From this centre, trunk line railways radiate in all directions; the Delaware and Hudson north to Montreal and southwest to Binghamton; the Fitchburg and the Boston and Albany east to Boston; the New York Central and the West Shore south to New York and west to Buffalo, besides other roads to other points.

It is not strange then that five cities and several large villages are grouped in this vicinity. The cities are Albany, Troy, Cohoes, Watervliet and Rensselaer.

ALBANY, next to New York City the oldest of New York towns, was established as a trading post by the Dutch in 1617. Later, a fort was built at this point to guard the river and settlement. It was called Fort Orange, and finally, by the English, named Albany. Like so many other New York towns, Albany dates its prosperity from the time of the opening of the Erie Canal. Yet other

causes have contributed to the growth of this group of cities, of which Albany is the largest.

Through these cities passes the commerce of the Erie and Champlain canals, once so extensive but now going

**Fig. 36.**

**The State Capitol at Albany. (Copyrighted by Geo. P. Hall & Son, N.Y., 1899.)**

more and more to the railways. Lumber from the Adirondacks and Canada; marble, iron and slate from Vermont and northern New York; farm products from the West; and the manufactures of New England and New York in their movement to various markets, find here a convenient centre of distribution.

Albany has been the seat of the state government since 1797. The state capitol building (Fig. 36), is a beautiful structure, especially in its interior (Fig. 37). In it are the offices of a great number of state officials; the chambers where the Senate, the Assembly, and the Court of Appeals hold their sessions; the state library, and the offices of the Regents and of the Department of Public Instruction.

FIG. 37.
A glimpse in the interior of the Capitol Building to show the beautiful carving. (Copyrighted by Geo. P. Hall & Son, N.Y., 1899.)

On the eastern side of the river, opposite Albany, is the city of RENSSELAER. At WEST ALBANY are immense car shops where cars and locomotives for the New York Central Railway are made.

Six miles north of Albany is the city of TROY, one of

the prominent manufacturing cities of the state. It is an interesting fact that some cities, while engaged in a variety of manufactures, throw their chief energy into a single industry which is peculiarly favored by the location, or perhaps by other advantages. An excellent example of this is seen in Troy, the city of collars, cuffs, and shirts. In the making and laundering of these, twenty-five thou-

FIG. 38.

Scene in a great shirt factory in Troy.

sand people, a third of the population, are employed. There is no other city so largely engaged in this line of manufacture. Nearness to large cotton mills, where the cloth is obtained, and to large cities where the goods may be sold, have combined with the excellent shipping facilities to favor the development of this industry in Troy and in surrounding cities and towns. Nearly all of the larger villages in the counties about Troy are also engaged

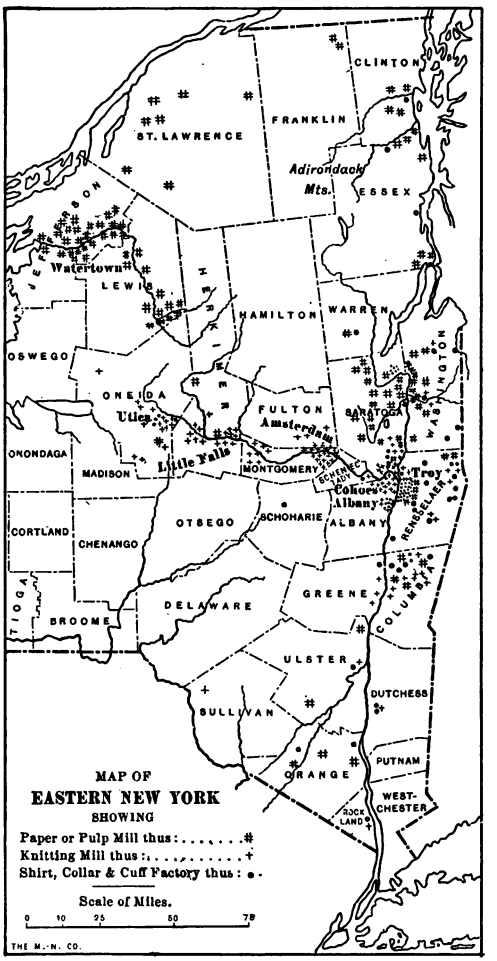



FIG. 39.

QUESTIONS. — On or near what two rivers are most of the paper mills located? Why? Where are most of the knitting mills found?

in making these same articles (Fig. 39). This city may fitly be called the nation's chief laundry (Fig. 38).

WATERVLIET, where the Erie Canal reaches the Hudson, is opposite Troy. At the United States arsenal, situated there, the great cannon used in our coast defences are made. A rifled cannon fifty feet long and with a bore sixteen inches in diameter, the largest of its kind in the world, was recently made at this arsenal.

Just before joining the Hudson, the waters of the Mohawk

plunge over a ledge forming the falls around which COHOES has grown up. Like many other cities, it owes its location and much of its growth to the water power here available for manufacturing purposes. Few important manufactories now depend solely upon water power, for in a dry season it may become insufficient, and steam must then be employed. Yet wherever water power can be used, its cheapness makes it an important aid in manufacturing. It is on this account that Cohoes has become the centre of a great industry, the manufacture of hosiery. In this one city nearly a third of the hosiery of the United States is manufactured. No other section of the country makes such quantities of underwear, stockings and shirts as the upper Hudson and Mohawk valleys (Fig. 39).

WATERFORD and MECHANICSVILLE (Fig. 1) are two of the nearby villages largely devoted to the manufacture of knit goods and shirts. LANSINGBURG is noted for the manufacture of brushes, and HOOSICK FALLS for harvesting machinery. HUDSON and CATSKILL (Fig. 1) farther down the Hudson are also in the region of knit goods manufacture of which Cohoes is the centre (Fig. 39).

**The Upper Hudson and Lakes George and Champlain.** — A lowland between the mountains of New England and the Adirondacks extends from the Hudson valley to Canada. This region, in a part of which lie Lakes George and Champlain, is full of interest for every American boy and girl. In the statements about the history of the state it was pointed out that the valley of Lake Champlain is a natural doorway between Canada and the United States (p. 25). In colonial days, when settlers occupied only the eastern part of the continent, this was almost the only convenient route for the movement of armies between

the two sections. Because the control of this route in the different wars was of great importance to both parties, forts were built at many points. Most of these have gone to ruin, but their names are retained by the villages which grew up around them. Such are FORT EDWARD, FORT ANN, TICONDEROGA, and CROWN POINT (Fig. 15).

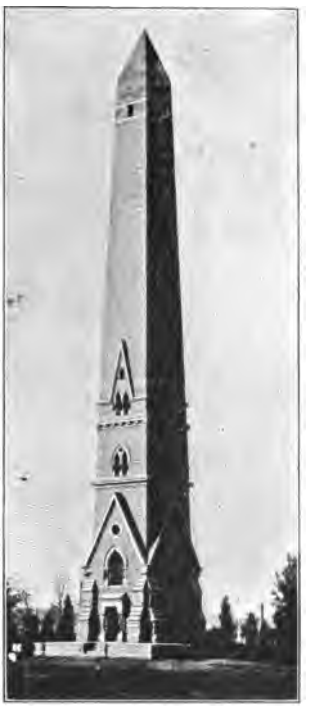


FIG. 40.

The monument to commemorate the battle of Saratoga, at Schuylerville, N.Y.

The histories tell some thrilling tales of brave deeds and fierce battles connected with this region. The greatest of all these battles, known as the battle of Saratoga, was fought on the west side of the Hudson between the villages of Stillwater and Schuylerville. The fine British army under General Burgoyne had come up Lake Champlain and was marching toward Albany, when the Americans met it and for two days steadily drove back the English and compelled the entire army to surrender on the spot where the village of Schuylerville now stands. On the hill overlooking this village is a beautiful monument, 150 feet high (Fig. 40), commemorating this, the most decisive battle in the Revolutionary War (p. 29).

Not far from this battle ground is the celebrated village of SARATOGA SPRINGS. The rocks underlying the region are full of cracks which reach down deep into the earth, and up through which bubble mineral waters with valuable medicinal qualities. Thousands of people resort here each summer for health and recreation. For many years Saratoga Springs was the most famous summer resort in America.

A little farther north are the spurs of the Adirondack Mountains. In addition to lumbering, there is another very important industry carried on in the vicinity of these mountains. Nearly every village in the counties on their southeastern border has one or more pulp and paper mills. Wood pulp is ground wood, mostly spruce. It is mixed with water, and rolled into great sheets like thick pasteboard, and is used in making paper, especially the cheaper grades. The towns which girdle the Adirondacks form the greatest pulp and paper making region in the United States (Fig. 39). This is due to the abundance of spruce in the mountains and to the comparative nearness of the

FIG. 41.

The water power in the Hudson at Glens Falls. (Copyrighted, 1890, by S. R. Stoddard, Glens Falls, N.Y.)

mills to such great printing and publishing cities as New York and Boston.

GLENS FALLS is one of the stirring villages of this section. It is the most northern of the towns which are extensively engaged in manufacturing shirts, collars, and cuffs. What city leads in this industry? Not far away is Mt. McGregor where General Grant died in 1885. Where is his tomb?

The southwestern foothills of the Green Mountains are partially in New York. In them are quarries of excellent slate (Fig. 9), which, when split into thin sheets, is used for the roofs of buildings. What other uses has slate?

REVIEW QUESTIONS. — Describe the changes in the Hudson valley due to the sinking of the land. In what respects is the Hudson not a true river? Why has the sinking of the land been a benefit? Who discovered the Hudson River? Where was the first settlement? How have the Hudson and Mohawk valleys aided in the settlement of the state? Why were these valleys so important in the early wars? What railways run along the Hudson River? Why have the Hudson and Mohawk valleys become the great manufacturing section of the state? Name the five mineral products which are so valuable in the Hudson valley. Why are they more valuable here than if they were in northern New York? What else is supplied to New York from this region? Name and locate the eleven cities along the Hudson. How is cement or hydraulic lime made? For what is it used? Show why it is natural that the region about the mouth of the Mohawk should be a centre of population and industry. Name and locate the cities situated there. State the leading historical facts about Albany. What great event occurred on the Hudson River in 1807? How did the event influence the building of the Erie Canal? What man was foremost in securing the Erie Canal? What shows the benefit of this canal to the state? Tell what you can about Albany; about Troy; Cohoes; Watervliet; Rensselaer. In what does Troy lead all other cities? Cohoes? Locate and tell about Waterford and Mechanicsville; Lansingburg; Hoosick Falls; Hudson and Catskill. Locate Ticonderoga, Crown Point, and Fort Edward. Why should Ticonderoga have been selected as a place for a fort? Locate Glens Falls, and

Saratoga Springs. For what should each be remembered? What is manufactured in great quantities along the upper Hudson? Why in this section? What is wood pulp? For what is slate used? What canal joins Lake Champlain and the Hudson River?

SUGGESTIONS. — Learn more about Ethan Allen and the capture of Ticonderoga. Bring to the class any pictures you can get of Lake George, Lake Champlain, Saratoga Springs, Mt. McGregor, and other places in this region. Examine pieces of wood pulp. James Fenimore Cooper has written a noted story which deals with this region. Have you read the story? What do you know about General Grant?

## NORTHERN NEW YORK

MAP QUESTIONS (Fig. 1). — What counties border the St. Lawrence River and Canada? What counties border Lakes Champlain and George? Which is the largest county of the state? In what county is the highest portion of the Adirondacks; that is, the region of Mt. Marcy? What large rivers rise in the Adirondacks? What river system receives most of the Adirondack drainage? Why are there so many streams flowing from the Adirondacks? How long is Lake Champlain (use scale of miles)? What is the outlet of Lake Champlain? Why has the Champlain valley been of so much importance in the history of New York? Where are the Thousand Islands? Which is the northernmost village in the state? Locate Watertown and Ogdensburg.

You have already learned (p. 1) that northern New York is the oldest and highest portion of the state. You will remember that all of North America did not become dry land at one time, but that certain parts of it, the Adirondack region among them, were raised above the sea long before the other parts were.

Review pages 1–5 and 65, in order to recall why and how these mountains are valuable; what industries they have led to; how lumbering is carried on; why the reckless destruction of forests is wrong; what is being done to prevent it; why the population is so sparse; how the people who live there are employed in summer

and in winter; what minerals are produced; why iron mining in this region is not more profitable; why so much wood pulp and paper are made in their vicinity.

It would be wrong to think that all of northern New York is mountainous. To be sure, the eastern portion is high and rugged, and there is only a narrow strip of lowland between the mountains and Lake Champlain. But

FIG. 42.
Cutting timber in the Adirondacks.

between the St. Lawrence River and the Adirondacks lies much good farming land. The great number of streams, supplied from the mountain lakes, makes the land excellent for pasturing cows from whose milk great quantities of butter and cheese are made. It takes about ten pounds of milk for a pound of cheese and twenty pounds for a pound of butter. In the production of these two articles St. Lawrence County leads all others in the state (Fig. 58). Why should the milk of this section be made into

butter and cheese instead of being shipped to cities, as is done in the southeastern counties? Where are the great butter and cheese sections of New York State (Fig. 58)?

It is evident that for many reasons this part of New York is not adapted to extensive and varied manufacturing. Suggest some of the reasons. Yet the water power of the many streams and the forests of spruce wood in the mountains have created there a vast pulp and paper making industry, especially along the Black River and the upper Hudson (Fig. 39).

FIG. 43.

**Drawing a load of logs from the forest in the Adirondacks.**

In the northern part, in the region of Malone, hop raising has been extensively and profitably carried on. For what are hops used?

In the region around Potsdam are quantities of excellent building stone known as Potsdam sandstone. What other kinds of building stone do you know of? At Gouverneur there are large marble quarries. For what purposes is marble used? Not far away are quarries of soft, soapy stone called talc (Fig. 9). It is ground to a fine powder and is used in the manufacture of paper to give it a smooth surface. Iron is

mined at various places on the eastern side of the Adirondack Mountains (Fig. 9); and near Lake George are mines of graphite, the material of which the "lead" of lead pencils is made.

No other portion of New York has so few cities. This is partly because much of the surface is mountainous and partly because the comparatively few railways and the distance from large cities are unfavorable to manufacturing.

FIG. 44.

**Old style way of boiling the maple sap in the forest to make maple sugar. In many sections this is an important industry in the spring.**

The Black River furnishes water power at several points. At one of these the flourishing city of WATERTOWN has grown up and is engaged in a variety of manufactures, especially paper making.

OGDENSBURG is the most northern of New York cities. It is an important commercial and manufacturing centre due to its railway facilities, and its position on the St. Lawrence River.

Locate on the map each of the cities and villages mentioned; also PLATTSBURG, a busy village on the Champlain shore. What railway runs from Ogdensburg to

Watertown and along the shore of Lake Ontario to Niagara Falls?

**Summary.** — Northern New York is the most thinly populated portion of the state. The mountainous section is largely forest covered, and lumbering is the leading industry. Surrounding the Adirondack Mountains is the greatest paper-making region in the United States. Iron and graphite are mined, and marble, sandstone, and talc are quarried. The more level portions are devoted to dairy farming, and St. Lawrence County is the largest butter and cheese producer among the counties of the state.

There are no very large cities and not many railways.

## THE MOHAWK VALLEY

MAP QUESTIONS (Fig. 1). — Where does the Mohawk River rise? What other large river rises in the same region? Through what counties does the Mohawk flow? Locate Schenectady, Amsterdam, Gloversville, Johnstown, Little Falls, Utica and Rome. How does the area drained by the Mohawk and its tributaries compare with the area drained by the Susquehanna and its branches in New York?

Reference has already been made to the influence of the Mohawk valley in the development of New York (pp. 20 and 57). How the valley was lengthened and enlarged when the great glacier was melting, and how the glacial river cut through the low mountains at Little Falls, has already been explained (p. 19). This gap, which offers the best opening through the eastern mountains to the interior of the continent, has meant a great deal to New York, for it has made the Erie Canal possible, and has brought to the state the commerce of a large portion of the West.

Because of the ease of entrance, the Mohawk valley was

early settled by the sturdy Dutch farmers. Its farm lands are among the best in the state. The region is especially adapted to dairy farming, and is celebrated for its butter and cheese. LITTLE FALLS and UTICA have long been noted cheese markets. Much broom corn is raised for the manufacture of brooms. The raising of sweet corn, peas, and beans for canning, which has become an important industry in many parts of the state, is extensively carried on in the upper Mohawk valley, and canning factories are located in many of the towns. ROME, for example, has a very large one, employing in the canning season more than a thousand persons (Fig. 45).

FIG. 45.
Sorting corn for canning at Rome.

For reasons already mentioned there are many towns and cities along the Mohawk which have become the seats of important manufactures. This is especially true of the manufacture of knit goods, in which thousands of people (Fig. 39) are employed.

SCHENECTADY is one of New York's old and historic

FIG. 46.

**Gathering beans for the cannery, in the Mohawk valley.**

towns. It was burned by the French and Indians in 1690 during one of the invasions from the north. Here is located Union College, the second oldest college in the state. What and where is the oldest one (Fig. 26)? Schenectady was the western terminus of the Hudson and Mohawk railway, the first railroad in the state, built in 1831, and extending to Albany (Fig. 17). Among its many manufacturing institutions are two very large ones, the Schenectady Locomotive Works and the shops of the General Electric Company. The latter company employs about seven thousand persons.

AMSTERDAM is one of the most extensive carpet-manufacturing cities of the state. The sister cities of GLOVERSVILLE and JOHNSTOWN are celebrated for the manufacture of gloves and mittens. There is no better example of a city almost wholly devoted to one industry than is seen in Gloversville or Johnstown. Although neither of these cities is very large, yet together they have more than a hundred and fifty factories, large and small, which make leather gloves and mittens, supplying more than half of all that are used in the United States.

LITTLE FALLS, in addition to being a leading cheese market, is one of the cities largely engaged in making knit goods of all kinds (Fig. 39).

UTICA and ROME began as frontier forts and trading posts in colonial days when the Mohawk valley was playing an important part in the early history of New York. While

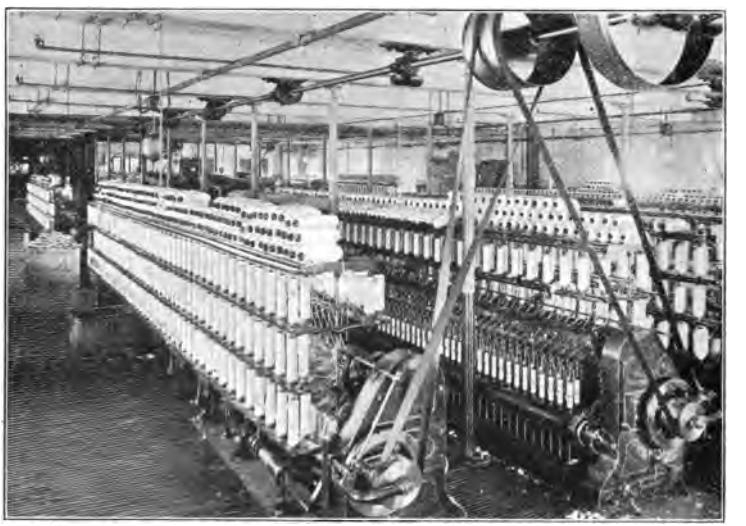


FIG. 47.

Spinning cotton in a great cotton mill at Utica. (Copyrighted by Geo. P. Hall & Son, N.Y., 1899.)

the Champlain valley was more frequently used as a military route between Canada and the settled portions of New York, yet armies also invaded the state by crossing the eastern end of Lake Ontario and marching down the Mohawk valley. As a means of guarding this passage, Forts Stanwix and Schuyler were built. The forts have gone to ruin, but on the site of Fort Schuyler stands

Utica, the seventh in size of New York's cities. Fort Stanwix became Rome (Fig. 15). During the Revolution one of the bloodiest battles of the war was fought at Oriskany, near Utica. It was a great victory for the Americans, and hastened the defeat of General Burgoyne at Saratoga (p. 64).

UTICA has grown rapidly since the building of the Erie Canal and the New York Central Railway. It now has

FIG. 48.

**Weaving cotton cloth at Utica. (Copyrighted by Geo. P. Hall & Son, N.Y., 1899.)**

the most extensive cotton and woollen mills in the state (Figs. 47 and 48). ROME, at the junction of the Black River and Erie canals, is the centre of a rich farming region and has very large canning factories (Fig. 45). There are several manufacturing towns in addition to the cities already named. The largest of these are ILION and HERKIMER.

A little to the south of Little Falls is Otsego Lake, which, though near the Mohawk, drains southward into the Susque-

hanna River. At the southern end of this lake lies COOPERSTOWN, once the home of James Fenimore Cooper, author of the "Leather Stocking Tales" and other books. Have you read of Hawkeye, the famous hunter and scout, and of his friend, the Indian chief, Uncas? The scenes of several of Cooper's books are laid in New York State. Name some of them.

REVIEW QUESTIONS. — Why has this valley been so important in the history and development of New York State (pp. 29 and 57)? What change was made in the valley at the close of the glacial period (p. 19)? Why was this change so important? What cities are in this valley? For what kind of manufacturing is the Mohawk valley especially noted? What can you say of its farming industries? What city is noted for the manufacture of locomotives and electrical goods? For gloves and mittens? For carpets? For cotton and woollen goods? For canned goods? Why have the Erie Canal and the New York Central Railway been a leading cause for the extensive manufacturing along the Mohawk? What railways traverse the Mohawk valley? What do you know about James Fenimore Cooper?

SUGGESTION. — Let one recitation period be devoted to the interesting historical events which have taken place in the Mohawk region: the burning of Schenectady; the defeat of St. Leger at Oriskany; Forts Stanwix and Schuyler; the first railway; the building of the Erie Canal, etc.

## THE LAKE ONTARIO PLAIN

MAP QUESTIONS. — What counties of New York border Lake Ontario? Describe the three rivers of New York which flow into Lake Ontario. Describe the Oneida and Seneca rivers. What railway runs near and parallel to the Lake Ontario shore? What railways and canal traverse this plain from east to west?

**Physiography, Climate, and Resources.** — From the western end of the Mohawk valley a low plain from twenty to forty miles in width extends westward across the state (pp. 9–11). It is bounded on the north by Lake Ontario, and on the south it becomes more hilly, and the country

grows higher and higher toward the Pennsylvania border (Fig. 8). A portion of Jefferson and St. Lawrence counties, east of Lake Ontario, is included in this lowland area.

When the great ice sheet advanced over this section, it removed the former soil and left in its place a glacial soil, as it did in all other portions of the state, with the exception of the southern edge of Chautauqua and Cattaraugus counties. This glacial soil is deep and fertile and the general levelness makes it easy to till, so that the Lake Ontario plain is an excellent farming region. Therefore the forests have been so extensively removed that a larger proportion of the land is under cultivation than in any other section of the state. The ground-up limestone and limy shale make a soil favorable to wheat growing; but there are many other farm products.

A large body of water like Lake Ontario has a marked effect upon climate (p. 23). Water is more slowly heated and more slowly cooled than the land. Because of this it acts as an equalizer of temperature both in winter and summer, moderating the heat of day and the coolness of night. It also holds back the spring a little and prolongs the autumn. Such a climate is well suited to fruit growing because the buds do not open quite so early after winter has gone, and thus they are not exposed to the chilling winds or the possible frosts of early spring. It also keeps away early frosts in the fall and thus prolongs the growing season. Great quantities of apples, peaches, pears, plums, grapes, and berries are therefore raised in all the counties which border Lake Ontario. Orleans County alone produces a million barrels of apples in a favorable season.

Thus favored by climate and fertile soil, and further

aided by the best of shipping facilities, the Ontario Plain may well be called the garden spot of the Empire State. The shipping facilities have been determined by the physiography; for, as we have seen, this level plain, connected with the Mohawk valley and Lake Erie, favored the construction of the Erie Canal. It has since been equally favorable to railroad building, and is now traversed by several of the leading railways of the state. Many cities and villages have grown up along the Erie Canal and the New York Central Railway (see Map, Fig. 1).

Aside from the Black River in the extreme east, the only large streams flowing across this plain are the Genesee and Oswego rivers, both of which, owing to the effect of the glacier (p. 18), furnish water power which has led to manufacturing, especially at ROCHESTER and at the falls of the Oswego. But, on the whole, this is not an extensive manufacturing section; its chief wealth lies in its farm products and fruit.

**Rochester** (Fig. 51). — Again and again it has been pointed out that cities are not located by accident. They usually owe their growth to some natural advantage which that particular site offers. One of the natural features which very often leads to the location of a village is the presence of water power. In the early days steam power was not known, and factories depended upon water power to run their machinery. Thus the early settlers were most likely to collect near streams which could be made to turn the water wheels of their sawmills and gristmills. It is a noticeable fact that nearly every thriving village and many cities in this part of New York are at points on streams where water power may be obtained.

Seven miles back from the mouth of the Genesee River

is a series of three waterfalls (Fig. 49). Here, in 1810, a little settlement was made, and this settlement has grown into the busy and beautiful city of Rochester, the third city of New York. Chief among the causes for the growth of Rochester is the abundant water power which the Genesee River here affords.

FIG. 49.
The Falls, around which the manufacturing city of Rochester has grown.

With the building of the Erie Canal the city had the two conditions necessary to make a flourishing manufacturing centre; namely, *abundant and cheap power, coupled with means of cheap transportation.* A little later the Genesee Valley Canal was built from Rochester to Olean, most of the distance along the bank of the Genesee River. The hundreds of boatloads of lumber, shingles, farm produce, etc., which were shipped to Rochester by this route helped to make a prosperous city, and its growth was therefore rapid. But the day of ordinary canals is past; railways have replaced them, and the Genesee Valley Canal and many others throughout the country have been abandoned. In fact, the canal is now the site of one branch of the Pennsylvania Railroad.

The building of the New York Central Railway has done much for Rochester, as it has for all the places through which it passes. Now eleven railways enter

the city, supplying with necessary materials more than two thousand factories, and carrying away annually nearly three hundred million dollars' worth of manufactured goods. Rochester has a hundred factories engaged in

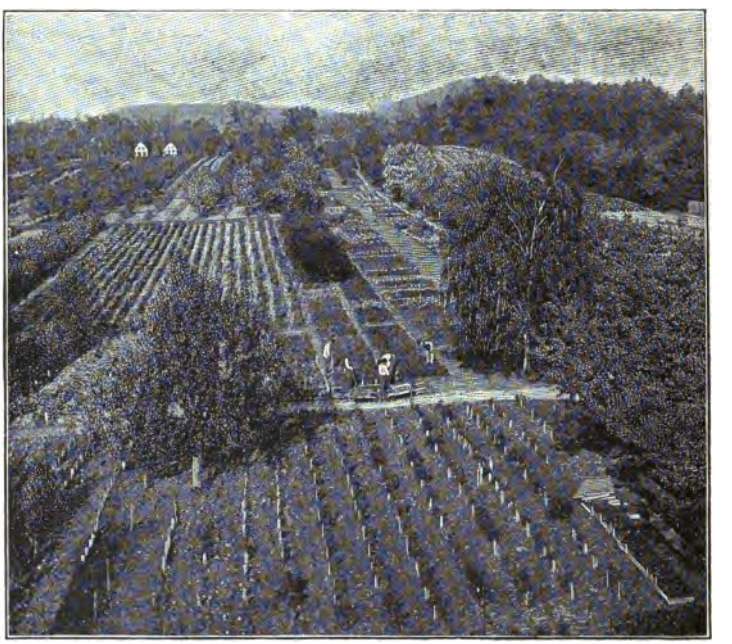


FIG. 50.

**The Mount Hope nurseries near Rochester. Here seeds, bulbs, shrubs, and trees are carefully raised for sale in many states.**

making clothing and boots and shoes alone. It ranks as one of the first four cities of the United States in these manufactures. In the production of photographic apparatus and optical instruments, and in the output of seeds and nursery stock, Rochester is the first city in the


ROCHESTER
and Vicinity.
0 1 2 3 4 5
6½ MILES TO 1 INCH.
LAKE ONTARIO
Manitou Beach
Ontario Beach
Windsor Beach
Charlotte
Forestlawn
Seabreeze
GREECE
IRONDEQUOIT
WEBSTER
MONROE
Glen Haven
PENFIELD
GATES
Rochester
Brighton
Lincoln Park
CHILI
BRIGHTON
West Brighton
Genesee R.
Mortimer
Pittsford
PITTSFORD
HENRIETTA
MENDON
SYRACUSE
and Vicinity.
0 1 2 3 4 5
6½ MILES TO 1 INCH.
CLAY
Woodard
CICERO
Liverpool
SALINA
DEWITT
Onondaga Lake
Lakeland
East Syracuse
Syracuse
Fayetteville
Elmwood Park
ONONDAGA
Onondaga Valley
East Onondaga
Jamesville
Reservoir
POMPEY
Pompey
LAFAYETTE
GLENVILLE
Scotia
SARATOGA
CLIFTON PARK
HALF MOON
SCHAGHTICOKE
Melrose
PITTSTOWN
Schenectady
NISKAYUNA
WATERFORD
Waterford
SCHENECTADY
Niskayuna
ROTTERDAM
Cohoes
Lansingburg
RENSSELAER
BRUNSWICK
Lishaskill
WATERVLIET
Green Island
Watervliet
Troy
Poesten Kill
GUILDERLAND
Guilderland
ALBANY
West Albany
NORTH GREENBUSH
POESTENKILL
Bath
ALBANY, TROY
and Vicinity.
Railroads thus :
Electric Lines thus :
0 1 2 3 4 5
6½ MILES TO 1 INCH.
Voorheesville
State Capitol
Albany
Rensselaer
EAST GREENBUSH
NEW SCOTLAND
Normanskill
BETHLEHEM

FIG. 51.

United States. A million and a half barrels of flour are ground yearly in its flouring mills. These last two named industries are in part dependent upon the fact that surrounding the city is one of the finest farming sections to be found in the state; and it is for this reason also that it has one of the largest canning factories in the United States.

Through its port, CHARLOTTE, at the mouth of the Genesee, Rochester has a considerable lake commerce, and doubtless the convenience with which articles of trade can be shipped to or from Rochester by way of the lakes has aided in its growth. Among its educational institutions is Rochester University.

**Syracuse** (Fig. 51). — This city owes its location and much of its growth to the salt springs in the vicinity. More than a century ago the Indians told the white men of these springs, though the Indians knew little of their value. In 1825 the settlement had grown to a small village, but with the building of the Erie Canal a great change came. This made it possible to cheaply transport the salt to the cities and towns which wanted it, and therefore the evaporation of the brine for the manufacture of salt became a great industry at Syracuse. The former importance of this industry may be judged from the fact that in 1868 over eight million bushels of salt were shipped from the city. The Oswego Canal was built connecting the Erie Canal and Lake Ontario, and then came the New York Central Railway, both of which increased the business of the city.

Syracuse has declined in importance as a salt-producing centre, partly owing to the increasing difficulty in obtaining the brine and partly to the opening of salt wells and

mines elsewhere; but it is now one of New York's busiest manufacturing cities. Among its many and varied manufactures are included articles of iron and steel, many kinds of machinery, bicycles, carriages, and shoes. It is one of the leading railroad centres of New York, and thus has excellent shipping facilities, both by rail and by canal. It is, moreover, almost at the exact geographical centre of the state, and because of its many advantages now ranks fourth among the great cities of New York. It is also the seat of Syracuse University, one of the larger of the universities of New York.

FIG. 52.

**Syracuse University.**

Just outside of Syracuse is the village of Solvay, where are located the Solvay Process Works. Here, from brine obtained from salt springs and wells some miles to the south of the city, is made half the soda used in the United States. The Solvay Company manufactures daily 350 tons of soda in various forms, using 2,000,000 gallons of brine; consuming daily 600 tons of coal; employing from 2500 to 3000 men and occupying 2000 acres of land: 700 tons of limestone are also needed daily in the process.

Name some of the uses of salt. Could salt be obtained from ocean water? How? Do you know the difference between table salt, dairy salt, and rock salt? What is the weight of

a bushel of salt? Of a barrel of salt? What is brine? Do you know of other localities where salt is produced?

**Other Cities of the Ontario Plain.** — The layer of hard limestone which causes the falls at Niagara extends as a pronounced ridge eastward through Niagara County. The plain north of this ridge is one or two hundred feet lower than that south of it, and at the point where the Erie Canal passes from the higher to the lower level it is necessary to have a number of locks. The water power furnished by the canal at this point, and the fact that this was a natural stopping place for boats, together with its situation in a rich farming and fruit region, are causes for the growth of LOCKPORT. This is a busy manufacturing city now connected with Buffalo by electric cars run by power supplied from Niagara (p. 51).

Niagara County is also a wheat-raising county, and flour-making is extensively carried on in Lockport and neighboring places. The manufacture of pulp and paper has become important both in Niagara Falls and Lockport, due to the water power and to the cheapness with which wood for the pulp is brought by way of the lakes and the Erie Canal. The plains near the lake are here, as elsewhere, the seat of an important fruit-raising industry.

On Lake Erie are several large cities, two of them among the largest ten cities in the United States; yet there is but one city on the New York side of Lake Ontario. On what river is this city, OSWEGO, situated? What waters are drained by this river? On what canal is Oswego? The reason for the scarcity of cities on Lake Ontario lies in the fact that Lake Erie forms a part of our

great navigable waterway, and Lake Ontario does not. With the building of the Erie Canal the Great Lakes had a connection with the sea, and Lake Ontario was cut off as an important commercial route for ships of the United States. In earlier years many boats came from Lake Ontario through the Oswego Canal into the Erie Canal, and thus a prosperous town grew up at the junction of the canal and lake. Oswego was long noted for the manufacture of starch and matches, at one time being the leading city of the United States in the manufacture of the former article. A proposition has been made to connect Lakes Erie and Ontario by a ship canal, and to then build a ship canal from Oswego to the Hudson. What effect would that have on Oswego? On Buffalo?

In colonial days Fort Oswego was a point of military importance, for it was one of the forts which guarded the Mohawk valley. A fort and garrison and a custom house are now maintained there. Why are they located there rather than at Syracuse or Rome? What is a custom house?

Among the larger villages are Oneida, Fulton, Lyons, Brockport, Albion, Medina, and Batavia. In what county is each located?

Batavia is a manufacturing town and railway centre. Near Albion and Medina are valuable quarries of building stone, known as Medina sandstone. The red variety is much used, especially in brick buildings. All of these villages are collecting centres for large quantities of fruit, grain, and beans, which are so bountifully produced on the Lake Ontario Plain. There are numerous canneries here.

**Summary.** — The deep glacial soil and the influence of Lake Ontario upon the climate make this a region of rich

farm lands and splendid orchards. Outside of the few cities, it is rather an agricultural than a manufacturing section. The Ontario Plain is noted for the large quantities of apples which it produces. Wheat and beans are other leading farm crops. The general levelness of the land aided greatly in building the Erie Canal and the railways which now traverse the plain. The cities are Rochester, Syracuse, Lockport, Niagara Falls, Oswego, and Watertown.

REVIEW QUESTIONS. — What counties border Lake Ontario? What rivers cross the Ontario Plain? Where does each of them rise? At what points do they furnish water power? How is this region finely adapted to farming? To fruit growing? To canal and railway building? What are the leading farm products? Give a review of the cities according to the topical outline (p. 107). Give a review of the Lake Ontario Plain according to the topical outline (p. 106). Make a sketch map of New York, locating on it the canals and all the cities thus far studied.

## THE FINGER LAKE REGION

MAP QUESTIONS (Fig. 1). — Name the five larger lakes of central New York. Name the counties touched by these lakes. By what river are they drained? Locate Auburn, Ithaca, Canandaigua, Geneva, Cortland, Penn Yan, Waterloo, Seneca Falls, Watkins. In what direction is Ithaca from Rochester? Which is farther north, Auburn or Albany?

**Physiography and Resources.** — In central New York is a region celebrated for its scenic beauty. It lacks the rugged grandeur of the Adirondacks, but it has a softer beauty all its own.

Before the glacier visited New York, in the valleys where now lie the Finger Lakes, streams flowed northward, but no lakes were there. The ice deepened these valleys in passing through them, and, as it melted, it left

deposits or dams of drift, behind which the water rose to the point of overflow. In this way the beautiful Finger Lakes were formed. They are long and narrow because they occupy former stream valleys. Many of the tributary streams flowing into these lakes tumble down the steep hillsides on either side of the valley and form the beautiful gorges and waterfalls for which the region is noted. Among the most celebrated of these are Watkins Glen (Fig. 12) and Havana Glen at the southern end of Seneca Lake. There are also dozens of beautiful falls and gorges around Cayuga Lake, among them being Taughannock Falls, the highest in the state (Fig. 53).

FIG. 53.

Taughannock Falls (215 feet high), on the western side of Cayuga Lake, a few miles north of Ithaca.

The larger of the Finger Lakes are connected by canals and joined to the Erie Canal, producing a means of inland navigation which was much used before railways were built in this region. This was of great importance, for even the richest of soils, forests, and mines

are of small value until their products have a convenient means of reaching markets.

The sunny slopes of the valleys, influenced by the large bodies of water (p. 23), are well adapted to grape raising. In fact, the region around Keuka and Seneca lakes is one of the most important grape-raising sections of the state. Where are the others (pp. 77 and 94)? Elsewhere there is varied agriculture, as in other sections of the state.

FIG. 54.

A typical New York creamery.

In many places limestone and flagstone are quarried. Salt underlies the whole region (p. 11), and salt wells have been sunk at Watkins, Ithaca, and many other places (Fig. 9). It was in this region that in 1779 General Sullivan conducted his famous and victorious campaign against the Iroquois Indians, who were helping the British against the Americans (Fig. 15).

**Cities and Towns.** — At the southern end of Cayuga Lake is ITHACA, the seat of Cornell University, the largest of the New York schools of higher learning with the exception of Columbia. The University takes its name from Ezra Cornell, its founder, who came to Ithaca a poor boy, but afterward became a wealthy man. Largely through his efforts and gifts the University is now one of the wealthiest in the land. It is beautifully situated on a hillside overlooking the upper end of Lake Cayuga (Fig. 55).

AUBURN, near the foot of Owasco Lake, is an active manufacturing city. One of the state prisons is located at Auburn. Where is another (p. 45)? GENEVA is a beautiful city at the foot of Seneca Lake. It has varied manufacturing industries and is the seat of extensive nurseries. What other city in New York is noted for its nurseries (p. 80)? CORTLAND in Cortland County is a railroad centre and manufacturing city.

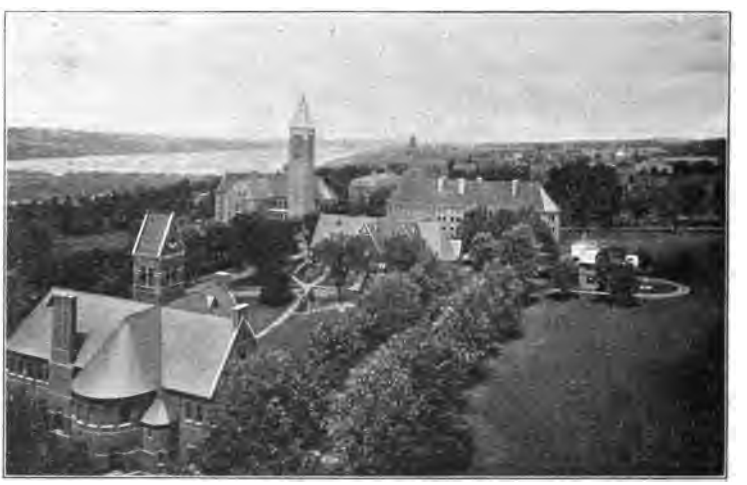


FIG. 55.

Some of the buildings of Cornell University. Lake Cayuga is seen in the distance.

Penn Yan, at the foot of Keuka Lake, is the centre of an important grape-raising area. Canandaigua, at the foot of Canandaigua Lake, Waterloo, and Seneca Falls on Seneca River, are other large villages of this region.

At Freeville, not far from Ithaca, is located an institution called the George Junior Republic, after its founder, Mr. George.

About a hundred boys and girls live there, most of whom come from families in large cities where they enjoyed few advantages. They elect a president, judge, and other officers, make their laws, punish offenders, till their farm, help build their buildings, publish a paper, and conduct their affairs very much as citizens of a real republic do; yet their president, judge, and other officials are only from fifteen to seventeen years old. Mr. William George and a few others exercise the necessary supervision; but self-government, to the fullest possible degree, prevails throughout the Republic.

**Salt Wells.** — West of the Finger Lake Region are the counties of Livingston and Wyoming, which, together with the Finger Lake Region, form the great salt-producing section of the United States (Fig. 9). The salt lies in a sheet, or bed forty to seventy feet thick and at a varying depth (p. 11). On the northern side the salt is reached at a depth of a few score feet, but the beds dip downward toward the south so that the most southern wells strike salt at a depth of over two thousand feet. The greatest number of salt wells is in the vicinity of Warsaw and Silver Springs in Wyoming County (Fig. 9).

FIG. 56.
The Worcester salt works at Silver Springs. Here the brine is evaporated, and the salt secured.

After a hole has been drilled to the bed of salt, water is pumped into the well. This dissolves the salt and becomes strong brine, which is then pumped out and carried in pipes to large storage tanks open to the air. The sun and air aid in the evaporation of some of the water, but the larger part is evaporated by artificial heat in great iron pans holding hundreds of barrels. As the water is driven off in steam, the salt settles to the bottom of the pans and is scooped out and dried; some of it is ground fine for table use, some left coarse for meat-packing purposes. Usually there are several wells in a group, some of which carry water to the salt, while through others the brine is pumped out. One salt company at Silver Springs (Fig. 56) consumes 125 tons of coal and produces 2000 barrels, or 560,000 pounds, of salt daily. Two quarts of brine yield about a pound of salt.

Some of the salt in Livingston County is mined much as coal is mined in Pennsylvania. A hole twelve or fourteen feet square, called the shaft, is dug down into the earth to the salt bed. The salt is then mined, carried to the shaft in cars, and hoisted to the surface in great lumps, sometimes weighing many pounds. Some of this salt contains sufficient impurities to unfit it for ordinary use, and this is sent to the cattle ranches of the West. The large lumps are scattered here and there over the pasture lands for the cattle to lick.

**Summary.** — The Finger Lake Region is famous for its beautiful scenery. Its lakes are due to the scouring action of the ice and to the drift deposits which the glacier left across the river valleys. In the vicinity of these lakes are many beautiful waterfalls, due also to the glacier. Around Keuka and Seneca lakes large quantities of grapes are grown. Wyoming and Livingston counties form one of the greatest salt-producing sections of the United States. Auburn, Ithaca, Geneva, and Cortland are the cities. Review the Finger Lake Region according to the topical outline given on page 107.

## THE SOUTHERN PLATEAU

MAP QUESTIONS (Fig. 1). — Name the counties which border on Pennsylvania. What large river systems have their headwaters in or near Allegany County? Where do these rivers flow? What name is given to a highland from which rivers flow in different directions? Locate Olean, Hornellsville, Corning, Elmira, Binghamton. Which is farther south, Hornellsville or Ithaca? Binghamton or Poughkeepsie?

**Physiography and Resources.** — In the central and western part of the state the land gradually rises from the Lake On-

FIG. 57.

**A dairy farm and buildings in Delaware County.**

tario Plain to the Pennsylvania border. While the general level of the Ontario Plain is only about three hundred feet above the sea, many of the hills of the southern counties rise to two thousand and twenty-five hundred feet. Between these hills are deep stream valleys bordered by steep, rugged hill slopes, frequently forest covered, and still the seat of a small lumbering industry. Among the products are hemlock and oak bark, used in tanning leather in the large tanneries at OLEAN and other towns.

The people are chiefly engaged in farming, though in most cases a different kind of farming than that carried on in the more level lands which border Lake Ontario. The river valley farms of this region are fertile, and splen-

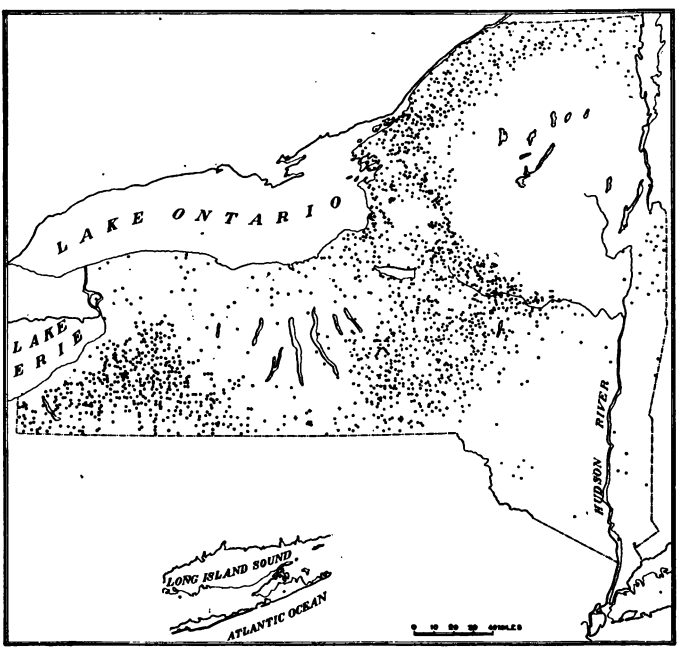



FIG. 58.

The butter and cheese factories of New York. The solid dot (●) shows cheese factories; the open circle (○), creameries, and the +, a combination of both.

did crops are raised; but much of the land is so hilly that it is better adapted to grazing. A reference to Figure 58 will show that Chautauqua, Cattaraugus, Allegany, and Steuben counties form one of the great dairy regions of the state.

Where the land is fertile and comparatively level, the farmer finds it more profitable to till the soil and raise crops. But where the hills are steep, he finds it better to carry on dairy farming. In such cases a part of the farm is given up to grass land on which the farmer pastures a herd of milch cows in summer. On the more tillable land he raises hay and grain, keeping a portion to feed to his cattle during the winter, and selling the remainder. Potatoes are usually an important crop in a dairy region. The cows are milked at morning and

FIG. 59.
**A herd of fatted cattle in the barn-yard.**

night, and the milk taken to some cheese or butter factory (Fig. 54) or shipped to the city (Fig. 28). In a good season the dairy cow gives from twenty-five to forty dollars' worth of milk, about the value of the cow.

The eastern portion of the plateau, including Chemung, Tioga, and Broome counties, is deeply dissected by several large rivers and their numerous tributaries. In the fertile farm lands of these valleys more land is tilled and less given to pasturage than in the more western counties.

Farther east, in Delaware and Sullivan counties, there is much dairy farming; but here, owing to the nearness of New York, the milk is sent to the city (Fig. 28) instead of being made into butter and cheese.

In the warmer valleys some tobacco and much fruit are raised; but the most noted fruit section in this region is that

FIG. 60.
A dairy herd stalled in the barn.

of northern Chautauqua County. Here is a narrow, gravelly plain bounded on the southern side by the plateau edge which forms a steep escarpment. The presence of a large body of water like Lake Erie tends to regulate climate, by preventing sudden changes either from one season to another or from night to day (p. 23). The high ridge, skirting the grape belt on the south, still further aids in preventing abrupt changes of temperature by confining the lake influence to the narrow plains, much as the Alps

check the escape of heat from the Mediterranean. Thus are produced the favorable conditions which make grape culture so successful in the Chautauqua belt. Riding through this section on the train one sees miles and miles of vineyards; and in spring the air is laden with the perfume of the flowers; in the autumn with the rich fragrance of the ripe grapes. In the latter season one will see long lines of cars on the side tracks into which baskets and trays of grapes are being loaded.

The oil-bearing sands and rocks underlie a portion of Cattaraugus and Allegany counties, and in earlier years the wells were numerous and profitable. The field now seems to be nearly exhausted, though some oil and considerable gas are still produced, and a part of the business of OLEAN is connected with oil production near by.

FIG. 61.

Many sheep are raised in New York, especially in the more hilly sections where there are tracts whose soil is not of the best quality. Name some of these sections.

**Cities.** — By the building of the Erie Railway through the southern tier of counties in the middle of the last century that region was opened earlier than the interior counties. Later, the building of the Delaware, Lackawanna, and Western, the Lehigh Valley, and other railways, by opening communication with New York, Buffalo, and other cities, led to still further development. Among the cities and manufacturing towns that have grown up along these

railway lines the largest is BINGHAMTON, a natural railway centre. In a hilly region, railways are compelled to follow stream valleys. This is well illustrated south and east of the Finger Lakes, where nearly all the railroads are along the Susquehanna River and its tributaries. Thus the junctions of large tributaries with the main stream will naturally be the railway junctions. For example, BINGHAMTON, at the meeting of the largest of the valleys, has become the chief railway centre of the region. Notice (Fig. 1) how the railways extend in all directions from this city. It is so near to Pennsylvania that coal is obtained cheaply, and Binghamton has extensive manufactures. It is also a very important centre for the manufacture of cigars, partly because of the tobacco raised in the warm enclosed valleys of this part of the state. NORWICH, OWEGO and ONEONTA are large villages in the neighborhood.

ELMIRA, on another branch of the Susquehanna River, is in many ways similar to Binghamton. It lies in a rich valley and railways from different valleys converge there causing it to be a natural railway centre and an extensive manufacturing city. It is the seat of a state reformatory where more than a thousand boys and young men are confined. A reformatory differs from a prison in that only young persons are sent there and that the purpose is more to reform and improve than to punish them.

HORNELLSVILLE and CORNING, in Steuben County, are cities which also owe their growth to their railway facilities. Both are growing manufacturing centres. Corning has extensive glass works where some of the finest cut glass is made. OLEAN has already been mentioned as being engaged in oil refining and leather tanning, because of the natural products of the surrounding country.

JAMESTOWN, still further west, has a variety of manufactures, notably worsted goods and furniture. In the manufacture of worsted goods it is one of the leading cities of New York. DUNKIRK, on the Erie shore north of Jamestown, is one of the two cities of New York especially noted for the manufacture of locomotives. What is the other city (p. 73)?

On the shore of Chautauqua Lake are the grounds and buildings of the Chautauqua Assembly, the seat of the well-known summer schools, and the centre of the Chautauqua educational movement. Find out more about this movement and the schools located there.

**Farm Life in Western New York.** — The widest difference exists between life in a great city (p. 38) and life on a farm.

The farmer's family lives in a story-and-a-half or a two-story frame house (Fig. 62), with a cellar and perhaps a dozen rooms. There are a large yard, an orchard, a garden, and trees surrounding the house.

FIG. 62.
A farm home in New York.

Drinking water comes from a well, and washing water from a cistern. The cellar is stored in the fall with potatoes, apples, turnips, cabbages, and beets for the winter's use. The woodshed contains piles of wood, cut from the wood lot on the farm; but often some coal is burned. The greater part of the food for the family comes from the farm; there is an abundance of milk, cream,

butter, eggs, fruit, and vegetables. A barrel or more of pork, perhaps one of corned beef, and a few pails of lard are put up each winter. The farmer takes to the gristmill some of the grain which he raises and brings home flour, with perhaps some buckwheat flour, graham, and corn meal. From the "sugar-bush" he may make, each spring, several hundred pounds of maple sugar and many cans of maple syrup, some for sale, some for his own use.

The farmer lives perhaps a quarter of a mile from the nearest neighbor, and two miles from the village store, post office, and church. The district school, which the children attend, may be a mile or two from the house; and, quite in contrast to the large schoolhouses of the city, it is a one-story, one-roomed building, with a single teacher and fifteen or twenty pupils. Yet from these district schools have come some of the ablest men of the nation. Can you name some of them?

Neighbors are not strangers here, and an old resident not only knows every one for miles around, but he knows their horses, and often first recognizes an approaching neighbor by the horse which he is driving. When riding about the country he usually speaks to every one whom he meets, even though he may not know him.

The farmer's family goes to bed early, perhaps soon after supper is eaten and the chores are done. They rise early, often before it is daylight; and the stock is fed, the cows milked, and the regular morning chores attended to before breakfast.

Poverty is almost unknown, and open-hearted generosity and neighborliness are everywhere. The farmer loves his farm home, which he has worked hard to pay for, and he finds genuine pleasure in tilling his soil, harvesting his crops, and tending his stock. He is free from the worry and excitement of the business life of the city, and in most cases he would not exchange his quiet farm home for residence in the noisy city.

**Summary.** — The Southern Plateau is a region of high hills and deep valleys. The valleys form excellent farm lands. In the more rugged parts lumbering is still carried

on. Much of the hilly land is given up to pasturage, and dairying is an important industry. In the western portion the milk is made into butter and cheese. In the eastern portion it is sent to the cities in milk trains. Chautauqua County is famed for its vineyards.

Oil and gas were once produced in large quantities and are still obtained to some extent in the region about Olean. The cities are Binghamton, Elmira, Corning, Hornellsville, Olean, Jamestown, and Dunkirk.

Review the Southern Plateau and its cities according to the topical outlines given on pages 106, 107.

## Summary and Conclusion

New York has a larger area and population than several of the European nations, and, with the single exception of Brazil, more people than any South American country. There are but few nations in the world whose foreign trade equals that of New York City. The foremost rank of New York among the states of the Union is due chiefly to advantages of position and of topography and to the wisdom which has been shown in making use of these advantages.

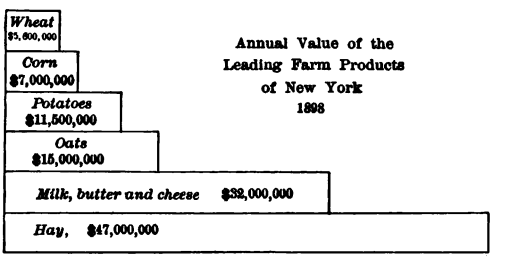


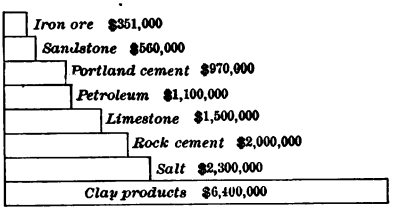

Fig. 63.

Compare with Fig. 64 to see the relative importance of farm and mineral products.

Moreover, the state has great natural resources in its forests, its soil, and its mineral deposits. Its soil is so

varied that almost every crop of a cool temperate climate is raised within its borders (Fig. 63). It leads the states in the yearly value of its hay and potato crops, its milch cows, and its dairy and nursery products. More than half the cheese made in the United States comes from New York.

The abundant water power has given a spur to manufacturing; and nearness to the Pennsylvania coal fields has added another advantage. The clay deposits for brickmaking, the limestone and cement, the building stone and flagstone, and the salt deposits yield many millions of dollars annually (Fig. 64).




Values of the Leading Mineral Products of New York, 1898.

FIG. 64.

All the advantages of position, natural resources, cheap transportation, and energetic men have combined to make New York the greatest of manufacturing states. Half of its manufacturing is done in New York City and Buffalo. Clothing, iron and steel products, books and newspapers, malt and distilled liquors, and boots and shoes are its manufactures of greatest money value.

Very early the navigable rivers and lakes were connected by canals, forming a wonderful system of internal water ways and leading to a rapid development of the whole state. Then came the era of railways, and these made farming more profitable and called forth new manufactories; while the increased production of farms and factories called for more railways and led to the building

of new cities and towns. Thus the great state of New York has pushed forward; and with its enormous wealth, commerce, and population it is fitly called the Empire State.

## Government and Education

**Government.** — New York shares with the other states all the advantages of union under a free, popular government. Name some of these advantages. Like the other states also it has its own government in affairs which concern the state alone. The state officers, elected by the voters for the purpose of making laws, are of two classes, *senators* and *assemblymen*, together forming the *legislature*. In what city does the legislature meet?

Laws are sometimes disobeyed or disputes arise, and such cases call for judges and courts. Some cases at law are of small importance, others are of very great importance. So there are different grades of courts, from the justice's court in each village to the *Court of Appeals*, which sits at Albany and is the highest court in the state. The cities have their own police courts, and each county has its county court, presided over by the county judge.

In addition to the lawmakers and the judges, there must be a great number of officers to attend to the public business and direct the affairs of the state. The highest of all these is the *governor*, elected for two years. What are some of his duties? The *lieutenant governor* presides over the senate, and takes the governor's place if the latter dies or resigns.

The business of the state is divided into many departments, each in charge of separate officials. Such are the treasury department, the department of prisons, of railways, of public instruction, and many others.

While state officers have authority throughout the entire state, they attend to only those matters which concern the people of the state as a whole. County matters are in charge of county officers. Name some of these officers and their

duties. City affairs are largely attended to by city officers, the mayor, the board of aldermen, and others. The counties are divided into townships, each with its own supervisor, town clerk, tax assessors, etc. The state is thus cut up into many small divisions, and by this means the people are given direct control of those matters which most closely affect them. But over all divisions the state government exercises such control as is necessary to preserve harmony and secure the welfare of the people, just as the Federal government maintains general control over the states.

SUGGESTIONS. — Who is the present governor of New York State? Who is the lieutenant governor? Who is your assemblyman? Who is your state senator? When were they elected? To what party do they belong? Judges of the courts hold office longer than any other class of officials. Give a reason for this. If you live in a city, name some of the officers of your city and their duties. Who is your mayor? If you do not live in a city, name some county officers and their duties. Who is your county judge? Sheriff? Mention some of the officers of a city which a small village would not need. Give your reason in each case why the office is not needed. Give a reason for the fact that there are two branches to the state legislature? Who signs all bills passed by the legislature before they become laws? What does it mean to "veto" a bill? Do you know of other state officers besides those already mentioned? How is the money raised to pay the salaries of all these officers?

**Education.** — Little was done for public schools by either the Dutch or the English while New York was a colony. Since New York became a state there have been three important steps in the growth of her school system:

(1) The schools were made public; any family might send children to school, but each family must pay for the schooling of its own children. (2) The schools were made free (1867); no payment is now required of those who attend the public schools where they live. (3) All children of school age are, by a recent law, *required* to attend school. Thus the steps taken have been (1) public schools, (2) free public schools, (3) compulsory attendance at school. Tell why

the schools should be free and why all children should be required to attend them.

The state is divided into several thousand school districts in each of which there is a public school. Sometimes two or more districts unite and have a "union school." Large villages and cities of course have more than one school. How many has your village or city?

Each district, village, and city has school officers who have general charge of its schools. Name some of these officers. What are some of their duties? If you live in a large town or city, tell some of the duties of the superintendent of schools. If not, name some of the duties of the school commissioner.

At Albany there are two bodies of school officials which have oversight of all the schools of the state; they are the officials of the Regents' Office and of the Department of Public Instruction. Tell something about each of these classes of officials.

There are several colleges and professional schools in the state, some of which you have already learned about. Besides these there is a Normal College at Albany, and eleven Normal Schools where young men and women are trained for teachers. The normal schools are at Buffalo, Brockport, Cortland, Fredonia, Geneseo, Jamaica, New Paltz, Oneonta, Oswego, Plattsburg, and Potsdam.

QUESTIONS. — What colleges or normal schools have some of your friends or teachers attended? What college or normal school is nearest your home? Do you know what is meant by the "Public Money"? Do persons who send no children to school pay school taxes? Why is this?

## REVIEW QUESTIONS

PHYSIOGRAPHY AND NATURAL RESOURCES. — (1) Where are the mountain regions of New York (p. 1)? (2) Where is the plateau region (p. 10)? (3) Where is the principal plain (p. 10)? (4) In what ways do the Adirondacks differ from the Catskills (p. 8)? (5) What are the natural boundaries of New York (Fig. 1)? (6) Describe its principal rivers (pp. 12–14). (7) Which ones furnish important water power (pp. 51, 63, 65, 70, 78, 83)? Where? (8) Name the large central lakes (Fig. 1). By what river are they drained (Fig. 1)? (9) Name the highest point in the Adirondacks (p. 1).

(10) What minerals do these mountains yield (Fig. 9)? (11) How is lumbering carried on (p. 2)? (12) Why is there so little farming in the Adirondack region (p. 1)? (13) What and where are the Palisades (p. 6)? (14) What are some of the effects of the sinking of the land in southeastern New York (p. 14)? (15) Describe the surface of Long Island (p. 7). (16) Are the Catskills real mountains (p. 8)? Why? (17) Describe the plateau region of western and central New York (p. 9). (18) Describe the Ontario Plain (p. 9). (19) Why is this so well suited to farming (p. 11)? What are the leading industries of the plateau region (pp. 10, 11)? (20) Describe the effects of the glacier in New York (p. 15). (21) What are moraines (pp. 7, 15)? What is till (p. 16)? (22) How were the lakes of New York formed (p. 18)? (23) Account for the shape of the Finger Lakes (p. 86). (24) Where are the three principal divides in New York (p. 13)? (25) Show how the physiography of New York has favored the building of canals and railways. (26) What are the leading mineral products of New York (Fig. 64)? (27) Where are the most important of these minerals respectively found (Fig. 9)? (28) Where are the best farming regions of New York (p. 11)? (29) In what agricultural products does New York stand first among the states (p. 100)?

Distribution of Industries. — (30) Name the leading industries of the Adirondack region (pp. 1, 4); (31) of the Catskill region (p. 8); (32) of the Ontario Plain (pp. 77, 78); (33) of the southern plateau (pp. 91–93); (34) of the Hudson valley (pp. 55, 62); (35) of the Mohawk valley (p. 72); (36) of Long Island (p. 8); (37) of northeastern New York, between the St. Lawrence River and the mountains (pp. 68, 69). (38) Locate, and where possible give the reasons for, the region or regions noted for (*a*) brickmaking (p. 12); (*b*) quarrying of flagstone (p. 12); (*c*) salt (p. 12); (*d*) oil and gas (p. 12); (*e*) valuable building stone (pp. 69 and 84); (*f*) slate (p. 12); (*g*) pulp and paper (p. 62); (*h*) laundered goods (p. 62); (*i*) knit goods (p. 62); (*j*) butter and cheese (p. 92); (*k*) lumbering (pp. 1, 8, 11); (*l*) leather tanning (p. 91); (*m*) ice gathering (p. 56); (*n*) milk bottling (pp. 56, 94); (*o*) nurseries (pp. 80, 88); (*p*) broom corn (p. 72); (*q*) grape growing (pp. 88, 94); (*r*) fine orchards (p. 77). (39) On an outline map of New York write in the different parts of the state the names of the leading industries in those parts.

Canals, Railways, etc. — (40) Show how canal and railway building are influenced by physical features. (41) Tell all you can about the Erie Canal and show its great importance in the develop-

ment of New York (p. 57). (42) Show how the topography of New York made the canal possible (pp. 20, 54). (43) What other canals are still kept up in New York (Fig. 1)? (44) Why are canals less used now than formerly? (45) What kinds of freight are canal boats especially adapted to carrying? (46) When did railway building begin in New York (p. 73)? (47) What were the first railways built (pp. 73, 95)? Where? (48) Name three railways in New York connecting Buffalo and New York City (Fig. 1). (49) What railway runs (*a*) near the shore of Lake Ontario? (*b*) Of Lake Champlain? (*c*) Along the Mohawk River? (*d*) Along the Hudson River? (50) What railway enters New York City (p. 44)? (51) Where is the chief railway terminus for New York City (p. 44)? (52) By what railway or railways could you go from Buffalo (*a*) to Syracuse? (*b*) to Elmira? (*c*) to Watertown? (*d*) to Geneva? (*e*) to Poughkeepsie? (*f*) to Utica? (53) By what route or routes could you go from (*a*) Binghamton to Albany? (*b*) Hornellsville to New York? (54) How could you go from your home to each of these cities? (55) Show how railways make farming more profitable. (56) Explain how manufacturing is more successfully carried on at railway centres. (57) Why are stone quarries of small value if situated far from a railway or navigable water? (58) On an outline map of New York show by dots the location of the cities, then draw lines for the Erie, Black River, and Champlain canals, and for the more important railways.

COUNTIES, CITIES, ETC. — (59) How many counties has New York (pp. 110, 111)? How many cities (p. 109)? (60) Name the counties (*a*) on the southern boundary of New York; (*b*) on the eastern boundary; (*c*) on the western boundary; (*d*) on the east bank of the Hudson; (*e*) on the west bank of the Hudson. (61) Through what counties does the main line of the New York Central Railway pass? (62) Through what counties does the Erie Railway pass? (63) Which of New York's counties is (*a*) the largest (p. 108)? (*b*) the smallest? (*c*) the most densely populated (p. 108)? (*d*) the most thinly populated? (64) What cities are on the Hudson River? (65) Which are on the Mohawk River? (66) Which are on the New York Central Railway? (67) Which are on the Erie Railway? (68) Answer *each* of the following questions for *each* of the following cities: New York, Buffalo, Rochester, Syracuse, Albany, Troy, Utica, Binghamton, Cohoes, Watertown: (*a*) In what county? (*b*) on what water? (*c*) causes of its location and growth? (*d*) for what noted? (69) Name some of the cities where important historical events

have occurred (Fig. 15). (70) Name cities which are important railway centres (Fig. 1). (71) Name in order of size the largest ten cities of New York (p. 109). (72) How many counties are included in New York City (Fig. 18)? (73) What cities are especially indebted to water power (question 7)? (74) How many cities are on the Erie Canal and Hudson River? (75) Why are the largest manufacturing plants not located in the large cities? (76) Why are there not more cities on Lake Ontario (p. 84)? (77) Why are there more cities in the Hudson and Mohawk valleys than elsewhere in New York? (78) Name and locate the city or cities noted for (*a*) nurseries (pp. 80, 88); (*b*) the manufacture of locomotives (pp. 73, 97); (*c*) of carpets (pp. 46, 73); (*d*) of cotton and woollen goods (p. 75); (*e*) of hosiery (p. 63); (*f*) of gloves and mittens (p. 73); (*g*) of laundered goods (Fig. 39); (*h*) of worsted goods (p. 97); (*i*) of paper and pulp (p. 70); (*j*) of cut glass (p. 96); (*k*) of cigars (p. 96); (*l*) of clothing (pp. 34, 80); (*m*) of shoes (p. 80); (*n*) of photographic and optical goods (p. 80). (79) Name two cities which are important lumber markets (pp. 52, 59); (80) Make a map of your home county, locating the principal towns, streams, railways, etc. (81) Bound your home county. (82) Bound your township. (83) What is the average number of persons per square mile in your county? (Compute from table on pages 110, 111.) Compare this with neighboring counties.

## Topical Review adapted for a General Review of Sections of the State

(*E.g.* The Mohawk Valley)

(1) Its Physical Features. — (*a*) Mountainous; hilly; level, plateau. (*b*) Rivers; lakes; natural boundaries; etc. (*c*) Water power.

(2) Its Natural Resources. — (*a*) Agricultural. (*b*) Forest. (*c*) Mineral.

(3) Chief Lines of Industry. — (*a*) Farming; fruit growing; dairying; canning. (*b*) Lumbering and allied industries. (*c*) Mining; quarrying; salt; oil; brick; cement. (*d*) Most important manufactures.

(4) How are the Industries influenced by the Physical Features and Natural Resources of the Region?

(5) Transportation Facilities. — (*a*) How far are they affected by physical features? (*b*) What has been their effect upon industries?

(6) CITIES AND CHIEF TOWNS. — (*a*) Location of each. (*b*) Special reasons for its location.

(7) OTHER FACTS OF INTEREST (*e.g.* historical associations, beautiful scenery, etc.).

## OUTLINE FOR TOPICAL REVIEW OF CITIES

(1) LOCATION. — Part of state; in what county; on what water?

(2) SPECIAL REASONS FOR LOCATION AND GROWTH (*e.g.* water power; at junction of natural trade routes; favorable point on navigable water, etc.)

(3) LEADING LINES OF INDUSTRY. — (*a*) Chief manufactures? (*b*) In what kind of trade especially engaged? (*c*) Is shipping important? why?

(4) HOW DOES ITS LOCATION FAVOR THESE INDUSTRIES?

(5) OTHER FACTS OF INTEREST. (*e.g.* historical associations, buildings, institutions, etc. In what does the city excel?)

## A FEW REFERENCE BOOKS, OF ESPECIAL VALUE IN THE STUDY OF NEW YORK STATE

Tarr, "The Physical Geography of New York"; The Macmillan Co., N.Y.

Hendrick, "A Brief History of the Empire State"; C. W. Bardeen, Syracuse. ($.75.)

Prentice, "History of New York State"; C. W. Bardeen, Syracuse. ($1.50.)

Todd, "A Brief History of the City of New York"; American Book Co., N.Y. ($.75.)

Lovering, "Stories of New York"; Educational Pub. Co., Boston. ($.40.)

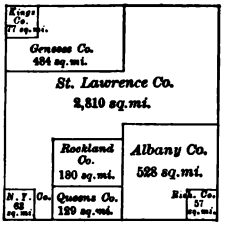
Roberts, "New York"; 2 vol., Houghton, Mifflin & Co., N.Y. ($2.50.)

Bardeen, "A Brief Geography of the Empire State"; C. W. Bardeen, Syracuse. ($.75.)

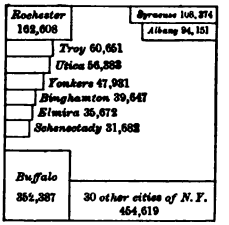
Irving, "Knickerbocker History of New York"; G. P. Putnam's Sons, N.Y. ($.75.)

Young, "Civil Government of New York"; American Book Co., N.Y. ($.90.)

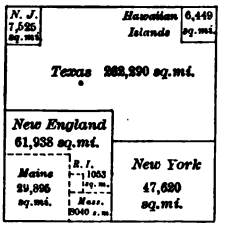
Much use can be made of illustrated magazine articles.




Showing the comparative areas of some of some of the counties of New York.



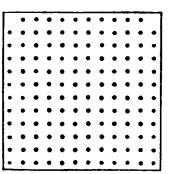

Showing comparative sizes of the cities of New York. The large square represents Greater New York, 3,437,202.



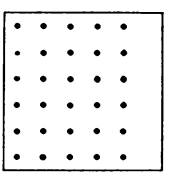

Showing comparative sizes of some of the divisions of the United States.

FIG. 65.

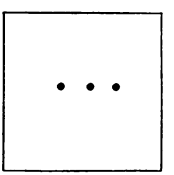
Illustrating some facts about the area and population of New York.



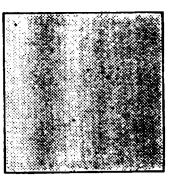
Hudson Valley Counties not including New York



Northern N.Y. Counties



Hamilton Co.



New York Co. (82,550 to sq. mi.)

FIG. 66.

The density of population of portions of New York State showing average number of people to a square mile.

## TABLES OF POPULATION, AREA, ETC.

### POPULATION OF NEW YORK STATE; 1790 TO 1900

| Census Years | Population | Increase, Number | Per Cent. | Census Years | Population | Increase, Number | Per Cent. |
|---|---|---|---|---|---|---|---|
| 1790 | 340,120 | | | 1850 | 3,097,394 | 668,473 | 27.5 |
| 1800 | 589,051 | 248,931 | 73.2 | 1860 | 3,880,735 | 783,341 | 25.3 |
| 1810 | 959,049 | 369,998 | 62.8 | 1870 | 4,382,759 | 502,024 | 12.9 |
| 1820 | 1,372,111 | 413,062 | 43.1 | 1880 | 5,082,871 | 700,112 | 16.0 |
| 1830 | 1,918,608 | 546,497 | 39.8 | 1890 | 5,997,853 | 914,982 | 18.0 |
| 1840 | 2,428,921 | 510,313 | 26.6 | 1900 | 7,268,012 | 1,270,159 | 21.2 |

## POPULATION OF LARGEST TEN CITIES OF NEW YORK; 1850 TO 1900

| Cities | 1900 | 1890 | 1880 | 1870 | 1860 | 1850 |
|---|---|---|---|---|---|---|
| New York | 3,437,202 | 1,515,301 | 1,206,299 | 942,292 | 813,669 | 515,547 |
| Buffalo | 352,387 | 255,664 | 155,134 | 117,714 | 81,129 | 42,261 |
| Rochester | 162,608 | 133,896 | 89,366 | 62,386 | 48,204 | 36,403 |
| Syracuse | 108,374 | 88,143 | 51,792 | 43,051 | 28,119 | 22,271 |
| Albany | 94,151 | 94,923 | 90,758 | 69,422 | 62,367 | 50,763 |
| Troy | 60,651 | 60,956 | 56,747 | 46,465 | 39,235 | 28,785 |
| Utica | 56,383 | 44,007 | 33,914 | 28,804 | 22,529 | 17,565 |
| Yonkers | 47,931 | 32,033 | 18,892 | 12,733 | 11,848 | 4,160 |
| Binghamton | 39,647 | 35,005 | 17,317 | 12,692 | 8,325 | 0,000 |
| Elmira | 35,672 | 30,893 | 20,541 | 15,863 | 8,682 | 8,166 |

## CITIES OF NEW YORK; CENSUS OF 1900

| | Population |
|---|---|
| Albany | 94,151 |
| Amsterdam | 20,929 |
| Auburn | 30,345 |
| Binghamton | 39,647 |
| Buffalo | 352,387 |
| Cohoes | 23,910 |
| Corning | 11,061 |
| Cortland | 9,014 |
| Dunkirk | 11,616 |
| Elmira | 35,672 |
| Geneva | 10,433 |
| Gloversville | 18,349 |
| Hornellsville | 11,918 |
| Hudson | 9,528 |
| Ithaca | 13,136 |
| Jamestown | 22,892 |
| Johnstown | 10,130 |
| Kingston | 24,535 |
| Little Falls | 10,381 |
| Lockport | 16,581 |
| Middletown | 14,522 |
| Mt. Vernon | 20,346 |
| Newburgh | 24,943 |
| New Rochelle | 14,720 |
| New York City | 3,437,202 |
| Manhattan Borough | 1,850,093 |
| Bronx Borough | 200,507 |
| Brooklyn Borough | 1,166,582 |
| Richmond Borough | 67,021 |
| Queens Borough | 152,999 |
| Niagara Falls | 19,457 |
| North Tonawanda | 9,069 |
| Ogdensburg | 12,633 |
| Olean | 9,462 |
| Oswego | 22,199 |
| Poughkeepsie | 24,029 |
| Rensselaer | 7,466 |
| Rochester | 162,608 |
| Rome | 15,343 |
| Schenectady | 31,682 |
| Syracuse | 108,374 |
| Troy | 60,651 |
| Utica | 56,383 |
| Watertown | 21,696 |
| Watervliet | 14,321 |
| Yonkers | 47,931 |

## VILLAGES OF 3000 OR MORE PEOPLE; CENSUS OF 1900

| | Population |
|---|---|
| Albion | 4,477 |
| Ballston Spa | 3,923 |
| Batavia | 9,180 |
| Bath | 4,994 |
| Brockport | 3,398 |
| Canandaigua | 6,151 |
| Canastota | 3,030 |
| Catskill | 5,484 |
| Dansville | 3,633 |
| Depew | 3,379 |
| Gouverneur | 3,689 |
| Green Island | 4,770 |
| Haverstraw | 5,935 |
| Hempstead | 3,582 |
| Herkimer | 5,555 |
| Hoosick Falls | 5,671 |
| Ilion | 5,138 |
| Lancaster | 3,750 |
| Lansingburg | 12,595 |
| Leroy | 3,144 |

| | Population |
|---|---|
| Fishkill Landing | 3,673 |
| Fort Edward | 3,521 |
| Fredonia | 4,127 |
| Fulton | 5,281 |
| Glens Falls | 12,613 |
| Mechanicsville | 4,695 |
| Medina | 4,716 |
| Newark | 4,578 |
| North Tarrytown | 4,241 |
| Norwich | 5,766 |
| Nyack | 4,275 |
| Oneida | 6,364 |
| Oneonta | 7,147 |
| Ossining (Sing Sing) | 7,939 |
| Owego | 5,039 |
| Peekskill | 10,358 |
| Penn Yan | 4,650 |
| Plattsburg | 8,434 |
| Port Chester | 7,440 |
| Port Jervis | 9,385 |
| Potsdam | 3,843 |
| Salamanca | 4,251 |
| Sandy Hill | 4,473 |
| Lestershire | 3,111 |
| Lyons | 4,300 |
| Malone | 5,935 |
| Mamaroneck | 4,722 |
| Matteawan | 5,807 |
| Saratoga Springs | 12,409 |
| Saugerties | 3,697 |
| Seneca Falls | 6,519 |
| Solvay | 3,493 |
| Tarrytown | 4,770 |
| Tonawanda | 7,421 |
| Walden | 3,147 |
| Wappingers Falls | 3,504 |
| Warsaw | 3,048 |
| Waterford | 3,146 |
| Waterloo | 4,256 |
| Waverly | 4,465 |
| Wellsville | 3,556 |
| Whitehall | 4,377 |
| White Plains | 7,899 |

## THE COUNTIES OF NEW YORK

| County | Organized | Area Sq. Mi. | Population 1900 | County Seat |
|---|---|---|---|---|
| Albany | 1683 | 528 | 165,571 | Albany |
| Allegany | 1806 | 1018 | 41,501 | Belmont |
| Broome | 1806 | 696 | 69,149 | Binghamton |
| Cattaraugus | 1808 | 1330 | 65,643 | Little Valley |
| Cayuga | 1799 | 722 | 66,284 | Auburn |
| Chautauqua | 1808 | 1062 | 88,314 | Mayville |
| Chemung | 1836 | 394 | 54,063 | Elmira |
| Chenango | 1798 | 847 | 36,568 | Norwich |
| Clinton | 1788 | 1041 | 47,430 | Plattsburg |
| Columbia | 1786 | 647 | 43,211 | Hudson |
| Cortland | 1808 | 486 | 27,576 | Cortland |
| Delaware | 1797 | 1581 | 46,413 | Delhi |
| Dutchess | 1683 | 800 | 81,670 | Poughkeepsie |
| Erie | 1821 | 1040 | 433,686 | Buffalo |
| Essex | 1799 | 1834 | 30,707 | Elizabethtown |
| Franklin | 1808 | 1717 | 42,853 | Malone |
| Fulton | 1838 | 486 | 42,842 | Johnstown |
| Genesee | 1802 | 484 | 34,561 | Batavia |
| Greene | 1800 | 644 | 31,478 | Catskill |
| Hamilton | 1816 | 1747 | 4,947 | Lake Pleasant |
| Herkimer | 1791 | 1426 | 51,049 | Herkimer |
| Jefferson | 1805 | 1252 | 76,748 | Watertown |
| Kings | 1683 | 77 | 1,166,582 | Brooklyn |
| Lewis | 1805 | 1265 | 27,427 | Lowville |
| Livingston | 1821 | 635 | 37,059 | Geneseo |
| Madison | 1806 | 649 | 40,545 | Morrisville |
| Monroe | 1821 | 643 | 217,854 | Rochester |

| County | Organized | Area Sq. Mi. | Population 1900 | County Seat |
|---|---|---|---|---|
| Montgomery | 1772 | 399 | 47,488 | Fonda |
| Nassau | 1899 | 252 | 55,448 | Mineola |
| New York | 1683 | 63 | 2,050,600 | New York |
| Niagara | 1808 | 522 | 74,961 | Lockport |
| Oneida | 1798 | 1180 | 182,800 | Utica |
| Onondaga | 1794 | 794 | 168,735 | Syracuse |
| Ontario | 1789 | 652 | 49,605 | Canandaigua |
| Orange | 1683 | 849 | 103,859 | Goshen |
| Orleans | 1824 | 396 | 30,164 | Albion |
| Oswego | 1816 | 974 | 70,881 | Oswego |
| Otsego | 1791 | 978 | 48,939 | Cooperstown |
| Putnam | 1812 | 289 | 13,787 | Carmel |
| Queens | 1683 | 129 | 152,999 | Jamaica |
| Rensselaer | 1791 | 664 | 121,697 | Troy |
| Richmond | 1683 | 57 | 67,021 | Richmond |
| Rockland | 1798 | 180 | 38,298 | New City |
| St. Lawrence | 1802 | 2810 | 89,083 | Canton |
| Saratoga | 1791 | 830 | 61,089 | Ballston Spa |
| Schenectady | 1809 | 210 | 46,852 | Schenectady |
| Schoharie | 1795 | 648 | 26,854 | Schoharie |
| Schuyler | 1854 | 339 | 15,811 | Watkins |
| Seneca | 1804 | 328 | 28,114 | Ovid. Waterloo |
| Steuben | 1796 | 1401 | 82,822 | Bath. |
| Suffolk | 1683 | 918 | 77,582 | Riverhead |
| Sullivan | 1809 | 967 | 32,306 | Monticello |
| Tioga | 1791 | 518 | 27,951 | Owego |
| Tompkins | 1817 | 477 | 33,830 | Ithaca |
| Ulster | 1683 | 1128 | 88,422 | Kingston |
| Warren | 1813 | 895 | 29,943 | Caldwell |
| Washington | 1772 | 797 | 45,624 | Argyle |
| Wayne | 1823 | 624 | 48,660 | Lyons |
| Westchester | 1683 | 450 | 183,375 | White Plains |
| Wyoming | 1841 | 608 | 30,413 | Warsaw |
| Yates | 1823 | 348 | 20,318 | Penn Yan |
| Total (61 counties) | | 47,620 | 7,268,012 | |

# INDEX

Numbers refer to pages